The Scientific Research Internship Program for Students from World-Renowned Universities

世界知名大学来华留学科研实习项目

華中科技大學

HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

WHY HUST

LEGEND HUST is:

ONE OF THE
TOP 10
universities among 2400 universities in mainland China

CURRENTLY WITH
985
projects, and one of the first-class universities in China

OF
1160
ACRES

WITH
72%
greenery coverage

QUALITY HUST has:

3400+
FULL–TIME TEACHERS

1400+
PROFESSORS

4
LIBRARIES
with a collection of 5.36 million volumes of books

ABOVE
95%
employment rate of graduates

SHANGHAI RANKING
91th
IN 2023 ACADEMIC RANKING OF WORLD UNIVERSITIES, SHANGHAI RANKING

THE WORLD UNIVERSITY RANKINGS
158st
IN 2024 HIGHER EDUCATION WORLD UNIVERSITY RANKING, TIMES

QS WORLD UNIVERSITY RANKINGS
275th
IN 2024 TOP UNIVERSITIES RANKING, QS

BEST U.S.News RANKINGS
109th
IN 2023 BEST GLOBAL UNIVERSITIES RANKING, US NEWS

94
UNDERGRADUATE PROGRAMS
(6 English–medium undergraduate programs)

187
MASTER'S PROGRAMS
(101 English–medium master's programs)

15000+
INTERNATIONAL ALUMNI FROM
160+
COUNTRIES

16
DISCIPLINES LISTED AS ESI 1%

175
DOCTORAL PROGRAMS
(105 English–medium doctoral programs)

Application Guide for 2024 Internship Program in Scientific Research for Students from World-Renowned Universities

Huazhong University of Science and Technology (HUST) is now officially starting the enrollment for "2024 Internship Program in Scientific Research for Students from World-Renowned Universities". This program will provide interns a platform to carry out forefront scientific research with HUST scientists. So far, there are 61 projects in total offered by 60 prestigious professors from 20 schools and departments of HUST. We are here waiting for you!

Eligibility

- 1. Applicants must be non-Chinese citizens with valid passports.
- 2. Applicants should come from the top 100 universities in the world or universities with world-leading specialties in specific areas.

Study Period

- Four weeks to one academic year according to different scientific research groups.

Application Procedure

- Application closing date: Continuous enrollment during the whole year.
- **Step 1** Log in to the online application system.
- **Step 2** Choose one Internship Program, upload the required documents, and submit your application. (Please contact vivianyan@hust.edu.cn before application. We will locate the most precise internship program according to your interests.)

Note:

The documents uploaded should be clear, complete, true, and valid. Incomplete or false applications will be rejected.
Please check the status of your admission process and the admission package tracking number through the International Students Application System or emails.

Documents Needed for Application

- 1. Passport.
- 2. Physical Examination Form .
- 3. Certificate of Non-criminal Record. A certificate issued by the police station or law enforcement agency certifying that you have no previous criminal record.
- 4. CV: Including educational background, work experience, and publication list if available.
- 5. Study Plan/Research Proposal.
- 6. Language Proficiency Certificate: Chinese or English Language Certificate should be provided.
- 7. Academic Certificate: official document of enrollment or graduation certificate issued by the current school.

Note:

All application documents must be in Chinese or English edition. Documents issued in the third language should be translated in Chinese or English editions.

Useful Information

You may access all information using the following UR code:

- Accommodation
- Transportation
- Student Activities
- Shopping
- Further information can be found on http://iso.hust.edu.cn/

Visas and immigration

- All students undertaking an internship will need to apply for visa. HUST will provide you with further guidance and instructions during your application.

Contact Us

- Find out more about internships by contacting us on vivianyan@hust.edu.cn.

HUST Scientific Research Internship Program

Wuhan National High Magnetic Field Center

Scan for more info of Wuhan National High Magnetic Field Center

- **Project 1: Fabrication of De Haas-van Alphen pick-up coil and measurements in pulsed high magnetic fields**
- Project length: 4 weeks
- Project Content:

The main research contents of Prof. Han Xiaotao's team are as follows: De Haas-van Alphen effect is one of the macroscopic quantum phenomena where the magnetic susceptibility of a sample shows 1/B (B is the magnetic field) periodic oscillations with increasing magnetic field strength. Currently, magnetization measurements under pulsed high magnetic fields adopts Maxwell's electromagnetic induction method. The corresponding pick-up coil has few turns and low sensitivity, which makes it difficult to detect this weak quantum effect. Professor Han Xiaotao's team is working to optimize design of the pick-up coil, and assemble high density with winding more turns in a limited sample space. Meanwhile, his team works to design the control circuit to eliminate influence of the increasing inductance of the coil on the physical property measurements in a short pulse time. Through thier effrots, his team is expected to realize an accurate measurement of De Haas-van Alphen quantum oscillations under pulsed high magnetic fields.

- Supervisor:

Prof. Han Xiaotao, Ph.D. supervisor, Executive Deputy Director of Wuhan National High Magnetic Field Center. As the head of the control system of the pulsed high magnetic field experimental facility of the national major scientific and technological infrastructure, Prof. Han Xiaotao was selected into the Program for New Century Excellent Talents in University by the Ministry of Education of the People's Republic of China.

- **Project 3: The pressure cell system for magnetization measurements under pulsed high magnetic field**
- Project length: 2 months
- Project Content:

The main research contents of Prof. Wang Junfeng's team are as follows: Pressure and magnetic field are both powerful stimuli to tune the electronic structures of matters. The combination of several extreme conditions will significantly promote the exploring to novel quantum phenomenon and deepen our understandings on related mechanisms. The proposed work consists in setting up a hydrostatic pressure device, coupled to magnetization measurements under pulsed high magnetic field, in order to study the novel phenomenon related to the spin and orbital orderings in various systems.

- Supervisor:

Prof. Wang Junfeng, Ph.D. supervisor, from Wuhan National High Magnetic Field Center, head of the magnetic characteristic measurement system of the High Magnetic Field Center, presided over the "Research on ferroelectric phase and physical effects driven by high magnetic fields" (2021-2024) of the National Natural Science Foundation of China.

- **Project 2: Observation of singular behavior of topological semimetal under high magnetic field**
- Project length: 3 months
- Project Content:

The main research contents of Prof. Zhu Zengwei's team are as follows: uncovering novel phenomena and laws of topological semimetal under high magnetic field, by measuring the electrical transport, magnetic torque and other properties in the environment of a 65T high pulsed magnetic field and a low temperature of 1.5K. Their team aims to investigate the magnetic torque and magnetoresistive of TaP, as well as magnetostriction during the topological phase transition at around 30T, to reveal the thermodynamic law of TaP during the topological phase transition.

- Supervisor:

Prof. Zhu Zengwei, Ph.D. supervisor, from Wuhan National High Magnetic Field Center, has worked in the École supérieure de physique et de chimie industrielles de la Ville de Paris (ESPCI), the Los Alamos National Laboratory (LANL) and the National High Magnetic Field Laboratory (NHMFL).

- **Project 4: Study of topological state computation**
- Project length: 4 weeks to one year
- Project Content:

The main research contents of Prof. Xu Gang's team are as follows: Learn about Density functional theory and how to do DFT calculation. Calculate the electronic structure and topological properties of topological insulators and topological semimetals using VASP, Wannier90, Wanniertools. Construct the BdG Hamiltonian from the Wannier function in order to calculate the superconducting energy spectrum and topological invariants, as well as to design an electron topological material and a topological superconductor.

- Supervisor:

Prof. Xu Gang, Ph.D. supervisor, from Wuhan National High Magnetic Field Center, received a doctorate from the Institute of Physics, Chinese Academy of Sciences in 2010, served as an assistant researcher of the Institute of Physics, Chinese Academy of Sciences from 2010 to 2012, and did visiting research at Stanford University in the United States from 2012 to 2016.

- **Project 5: Optical spectra of low-dimensional perovskite semiconductors in high magnetic fields**
- Project length: 6 to 12 months
- Project Content:

The main research contents of Prof. Han Yibo's team are as follows: Perovskite semiconductors possess promising opto-electronic performance and also bright spin-polarized photo-emissions at room temperature. His research is focused on the measurement and discussion of photoluminescence and optical absorption spectra of inorganic lead halide perovskite quantum dots, and aimed at providing physical basis for its application in spin-photonics.

- Supervisor:

Prof. Han Yibo, Ph.D. supervisor, from Wuhan National High Magnetic Field Center, presided over several programs of the National Natural Science Foundation of China, published more than 60 papers on Adv. Mater., Adv. Opt. Mater., PNAS, Phys. Rev. B, Appl. Phys. Lett. and other journals.

HUST Scientific Research Internship Program

Electronic Information and Communications

- **Project 1: Focal Stacking Images Fusion**
- Project length: 6 to 8 weeks
- Project Content:

The main research contents of Prof. Yang You's team are as follows: Focal stacks imaging is a vital imaging method for computational photography, macroscopic and microscopic imaging. Focal stack images (FoSIs) captured in focal stack imaging are a set of images focusing on multiple depth of scene, which have complementary spatial information. In his research, in order to overcome the spatial consistency problem in the transform domain-based method and the misalignment of focus map with object boundaries in spatial domain methods, an efficient edge-aware filter, guided filter is used to measure the focus. The FoSIs are fused by the pixel-wise spatial consistency of structures rule with focus map of guided filter measurement to obtain an all-in-focus image of scene. For the above method, focus map and fusion rule are calculated and designed, respectively. To jointly generate focus map and fusion rule, and improve the computation efficient. A method based on deep learning are proposed. In this method, a deep convolutional network can be trained to encode the mapping between source images and focus map. Similar to the fusion process of traditional fusion framework, the FoSIs are fused with the focus map detected by the convolutional network to obtain the result image. The proposed method based on traditional fusion framework and method based on deep learning will be verified via 6 test sequences respectively, and the experimental results will show that state-of-the-art performance can be obtained.

- **Supervisor:**

Prof. Yang You, Full Professor , Ph.D. Supervisor, IET Fellow, Senior Member of IEEE, Member of SPIE/OSA, Vice Dean of School of Electronic Information and Communications.

- **Project 2: Event Knowledge Graph: Construction, Induction and Application**
- Project length: 3 to 12 months
- Project Content:

The main research contents of Prof. Wang Bang's team are as follows: An event is defined as an event or set of events that are involved by multiple related actors at a specific time and place. The event knowledge graph is an event-centric graph that describes event information and various relationships between events. In the process of constructing, inducting and applying event knowledge graphs, a variety of natural language processing technologies are required, such as event extraction technology, information completion technology, relationship inference technology and event prediction technology. Event extraction techniques can extract information related to events from unstructured text data and present the information in a structured form. Information completion technology is to use the existing knowledge in the event knowledge graph to reason and complete some missing event(s) in an event knowledge map. Relationship inference technology uses information in the text to infer the coreferential, temporal and causal relationships between events. Event prediction technology is used to predict possible future events and analyze the evolution trend of events. This project will study the key technologies and algorithm models for the construction, induction and application of event knowledge graphs. Through the development of this project, interns will deeply learn and master the latest technologies such as deep learning, graph neural networks, comparative learning, prompt learning, etc., and design and develop related algorithms and models.

- **Supervisor:**

Prof. Wang Bang, Ph.D. Supervisor of School of Electronic Information and Communications, has over 100 technical publications, including 6 patents, 2 books, 7 book chapters and over 110 research articles in international conferences and journals.

- **Project 3: Multimedia Communications and Networking for Metaverse**
- Project length: 2 to 6 months
- Project Content:

The main research contents of Associate Prof. Yang Peng's team are as follows: Fundamentals of multimedia networking: Network architecture and transmission protocols; Virtual reality (VR) video coding: Multi-view cameras, mapping and coding; Mobile edge computing: End-edge-cloud coordinated framework, resource allocation and task scheduling; Enabling technologies of real-virtual interaction: the construction of digital twin and real-time interaction.

- **Supervisor:**

Associate Prof. Yang Peng, from the School of Electronic Information and Communications, has long served as reviewer of IEEE TMC, IEEE IoT, IEEE ComMag, IEEE WCMag and other top journals and magazines.

HUST Scientific Research Internship Program

Mechanical Science and Physics

School of Physics

- **Project 1:** Current-induced Transport and dynamics in Chiral Molecular Junctions
- **Project length: 10 months**
- **Project Content:**

The main problem we focus in this project is current-induced molecular dynamics in chiral molecular junctions. Prof. Jing-Tao Lu has been studied this type of problem for many years. The international student will learn from Prof. Jing-Tao Lu's group on this problem during the visit to finish their joint research project. This project also involves parters from Germany, Israel. Thus, through this project, we can also promote our international collaboration with other Eropean countries in the field of molecular electronics. The main problem we study includes the following points:

1. Develop theoretical framework to treat current-induced molecular dynamics in chiral molecular junctions.
2. Study the electronic structure, electron-rotation, electron-vibration interaction in such molecular junctions.
3. Study of Angular Momentum Transport in Chiral Junctions.
4. Study of Chiral-induced Spin Selectivity in Molecular Junctions.

- **Supervisor:**

Prof. Lv Jingtao, Ph.D. supervisor from School of Physics.

- **Project 2:** Nonlocal optical theory for Van der Waals materials
- **Project length: 3 - 12 months.**
- **Project Content:**

Van der Waals materials, or two-dimensional materials, emerge as an important material platform for various nanoscience branches including nanophotonics and optoelectronics. As rapidly progressing nanofabrication allows sculpting ever miniaturizing nanostructures, non-classical effects become indispensable in studying the optical properties of such nanosystems. This project aims at developing a semi-classical nonlocal optical theory to describe the non-classical effects of Van der Waals nanomaterials. Specifically, this mean-field theory would be able to effectively treat the non-classical effects with affordable numerical complexity, so that it is applicable to multiscale systems and useful for designing advanced nanophotonic devices. Within this project, the internship student will learn the underlying physics for developing the theory and gain numerical modelling experience by applying the theory to practical applications.

- **Supervisor:**

Prof. Pu Zhang, PhD supervisor, from School of Physics, has worked at the Theoretical Condensed Matter Physics Department of Universidad Autónoma de Madrid and DTU Fotonik. His research interest focuses on nanophotonics, nanoplasmonics, and quantum nanophotonic phenomena. He has published more than 30 peer-reviewed papers in internationally renowned journals, including 3 Physical Review Letters.

School of Mechanical Science and Engineering

- **Project 1:** Research on machining errors prediction modeling and database development of complex parts
- **Project length: 12 months**
- **Project Content:**

Complex parts are widely used in aerospace field and their service performance depends on the machining errors. It is of great research value to carry out accurate and rapid prediction of machining errors and build fast retrieval database. This research plans to focus on the following parts: 1) Establish the analytical prediction model of cutting force considering uncertainties; 2) Based on the numerical analysis method, construct the finite element simulation model of machining errors of complex parts; 3) Based on Gaussian process regression strategy, establish a fast surrogate model between machining parameters and machining errors; 4) Develop one database management software for machining process to realize the rapid retrieval of cutting force and machining errors under varying working conditions.

- **Supervisor:**

Prof. Peng Fangyu, Ph.D. supervisor, member of New Century Excellent Talents in Universities of the Ministry of Education of China, deputy director of National NC System Engineering Research Center, mainstay of State Key Laboratory of Digital Manufacturing Equipment and Technology.

- **Project 2:** Application of Laser Processing in Composite Material Manufacturing
- **Project length: 10-12 months**
- **Project Content:**

Carbon fiber-reinforced plastic (CFRP) is a carbon fiber-reinforced material based on resin. The role of the fiber is to enhance the loading capacity and improve the mechanical properties such as tensile, bending, and elastic-plastic properties; The resin matrix combines and protects the fiber to evenly transmit and distribute the load. Therefore, CFRP has the advantages of high specific strength and stiffness, which is the inevitable trend of lightweight development of important basic components in aviation, aerospace, automotive and other fields. However, the anisotropy of carbon fiber and matrix in CFRP (0°, 45°, 90°, and their intersection), the high fluctuation of interlaminar strength (5000GPa→200GPa), and the large difference of melting point (≥ 150 times) pose great challenges to the CFRP cutting and connection manufacturing technology.

In cutting processing, traditional mechanical processing has prominent problems such as poor molding, difficult processing quality assurance, and high processing costs. For example, drilling and milling are the main machining processes, and the fiber reinforcement in CFRP increases tool wear and reduces durability. At the same time, the anisotropy of fibers in CFRP and the fluctuation of interlaminar strength make the material easy to produce delamination, fuzzing, tearing and other defects under the influence of jitter cutting force. The defects worsen the quality and accuracy of CFRP, and is a potential threat to the long-term safe service of components. With its advantages of zero cutting force, fewer defects, and low stress, short pulse laser cutting technology has become an important way to cut and manufacture CFRP components with high quality and efficiency.

This subject aims at the requirements of laser cutting and joining of composite materials, studies the short pulse laser cutting process of CFRP or laser joining process of CFRP and metal, explores the influence of process parameters on the shape and thermal damage of the cut hole or joint, and evaluates its dynamic and static mechanical properties.

- **Supervisor:**

Prof. Huang Yu, Ph.D. supervisor, a special candidate for the "Independent Innovation Post" in Hubei Province, a "Yellow Crane Talent" in Wuhan, and a special professor of scholars in Central China.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- **Project 3:** Topology Optimization for Battery Module Design for Electric Vehicles using Advanced Genetic programming

- **Project length: 6 months**
- **Project Content:**

The main research contents of Associate Prof. Akhil Garg's team are as follows:

Extensive literature studies have been done on the battery thermal management systems. Four types of battery thermal management systems has been studied such as: the air cooling, the liquid cooling, the phase change materials and the hybrid (mixed) cooling systems for battery packs used in Electric Vehicles (EVs). These studies mainly focused on optimizing the design parameters such as the air flow rate, the air temperature, the liquid temperature, the liquid flow rate, the spacing between cells, the spacing between cells and pack casing, etc. for minimizing the temperature distribution, maximum temperature and standard temperature deviation and its volume simultaneously in the battery pack. In brief, the studies in the past emphasize on the optimum parametric design of battery pack cooling design, neglecting the structural design (shape and topology) of cooling channels of battery packs. Optimum structural design of cooling channels of battery packs can have paramount effect on the temperature distribution of battery packs thus minimizing the efforts for the design and development of sophisticated cooling systems including advanced and costly sensors. One leading example from Industry in the field of structural design of cooling channels of battery pack is TESLA, who had one patent on serpentine cooling channel design by maximizing the contact surface area of the cooling pipe.

The new structural designs of cooling channels of battery packs used in EVs can be generated using topology optimization method. Topology optimization is a technique employed to optimize the distribution of material within a design domain to produce structures with enhanced performance. Cooling plates are commonly employed for the liquid cooling-based thermal management of Lithium-ion batteries. This project shall firstly conduct the critical literature review on topology optimization for design of cooling channels of battery packs for electric vehicles (EVs). In the first stage, the general topology optimization methods are illustrated, and then the findings on topology optimization in the design of lithium battery liquid cooling plate shall be summarized. The ' battery pack cooling channel design problem ' can be described as solving the fluid flow control equation inside the battery liquid cooling plate, designing a suitable flow channel structure and making the fluid take away as much battery heat as possible under low pressure drop. The summary of the literature shall includes the following aspects: design objectives, topology optimization methods, geometric models (two-dimensional, three-dimensional, etc.), cooling plate inlet and outlet structure, fluid heat transfer model, variable selection and objective function, discretization methods (finite element, finite volume method, etc.), numerical analysis, optimization results, etc.

In the second stage, the project aims to compare the three types of cooling plate designs, such as the topology optimized cooling plates with double-outlet and single-outlet, and the conventional straight-channel cooling plate. The effects of fluid inlet conditions such as velocity and temperature on the behavior of all the designs shall be investigated. Topology optimization shall be performed using advanced variants of Genetic programming. Genetic programming inherits problem of large complex models with higher computational cost. Extensive literature has been published in the area of genetic programming but very few studies addresses problems relating to the complexity of models of genetic programming. In the past studies, the complexity of genetic programming model is measured by the number of nodes. This definition of measurement of complexity of models by number of nodes perhaps does not apply for functions, such as sin(x) and -x. These functions possess different complexity but have same number of nodes. The inaccurate measurement of complexity of genetic programming can result in inaccurate computation of objective function values because the objective functions used in framework of genetic programming comprises of standard error term (such as root mean square error, mean absolute percentage error, etc.) and the complexity term. Consequently, this may result in poor evolutionary search and leading to premature convergence of solutions. Depending upon nature of data and complexity of systems, the effect on algorithm accuracy and efficiency can be minimal or large one. Since, in this project, we are addressing the problem of optimum cooling plates design of battery pack, the higher algorithm accuracy and efficiency is vital. The advanced genetic programming shall incorporate new architecture such as introducing novel complexity measures based on multi-adapative regression splines, surrogates, and polynomials. The complexity of models evolved from genetic programming shall be computed and new objective values shall therefore be evaluated.

In the last stage, the objective functions along with its complexity measure shall be varied and its effect on the structural design and temperature distribution of the battery pack shall be studied. The objective functions shall be referred from literature (such as AIC, BIC, PRESS, SRM, etc.) and a new objective shall be formulated for this application combined with best complexity measurement method in the first page.

Finally, based on extensive literature review, and case study results, this project shall provide some futuristic suggestions on the research focus of topology optimization design of battery pack cooling channel.

Requirement: Student will conduct design and analysis in COMSOL software, and MATLAB. No prior knowledge on battery is required. Student shall work together with postgraduate students on this project.

- **Supervisor:**

Dr. Akhil Garg is working in Prof. Gao Liang group as an Associate Professor in the School of Mechanical Science and Engineering. He has been awarded titles from Guangdong Government such as Guangdong High Level Provincial Talent (Guangdong Yangfan) and ChuTian title from Hubei Province.He is an Associate Editor of ASME Journal of Electrochemical Energy Conversion and Storage, Regional Editor of International of Ambient Energy and Special Editor of ASME Journal of Computing and Information Science in Engineering.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- Supervisor：

Prof. Dr. Wei Guo is currently a professor in the School of Mechanical Science and Engineering in Huazhong University of Science and Technology. His research interest is mainly focused on high power laser processing (welding and additive manufacturing) and materials performance characterization under extreme environment (high/low temperature, radiation, corrosion, etc.) for civil nuclear and aerospace applications. Prof. Guo has published more than 30 peer-reviewed papers in Additive Manufacturing, CIRP Annals - Manufacturing Technology, Materials Science & Engineering A, Optics & Laser Technology and etc. He is serving as Guest Editor of Special Issue for two peer reviewed journals: Materials Science in Additive Manufacturing, and Photonics. He was elected for National High-level Young Talent Program of China, Senior Member of the Chinese Mechanical Engineering Society, Chartered Engineer (CEng) and Member of The Welding Institute (MWeldI) of the UK.

- **Project 4: Understanding degradation of laser welded structural materials for nuclear fusion under extreme environments**
- Project length: 12 months
- Project Content：

Future nuclear fusion power systems rely on the development of materials which can withstand some of the most extreme engineering environments (high temperature up to 1500°C, high fluxes of high energy neutrons irradiation, etc.). RAFM steel is a promising candidate structural material for Test Blanket Module (TBM) of the nuclear fusion reactor because of its excellent thermo-physical and mechanical properties. Maturation of welding technologies and processes is crucially important for the practical application of RAFM steel to fusion reactors. In fact, weld joints represent one of the potentially weakest structural locations. To date, some aspects of degradation of RAFM steel under the extreme environment have been preferentially studied. However, less attention has been paid to the degradation of welded RAFM steel under the extreme environment. This project will develop laser welding technique to weld the RAFM steel with defect free joints. The key questions that will be explored in this project will be the effect of radiation damage on the mechanical properties of these laser welded structural materials at ambient and operational temperatures, and microstructural evolution during the irradiation process using both in-situ ion irradiation and ex-situ studies. This investigation will allow for a fuller understanding of the basic degradation mechanism and mechanical performance of the welded structural materials under the extreme environment and importantly how these are affected by temperature and irradiation damage. Understanding how the mechanical properties of these welded structural materials change over time is critical for designing a robust TBM with acceptable lifetime and to allow safe disposal at end of life.

- **Project 5: Laser beam shaping additive manufacturing**
- Project length: 6 to 12 months
- Project Content：

Laser additive manufacturing, as one kind of novel manufacturing techniques of layer-by-layer forming according to geometric model, provides a decent option for complex geometric materials processing. Currently the most used heat source is a focused Gaussian beam for laser additive manufacturing. The uneven energy distribution (high in the center and low at the edge) of focused Gaussian beam tends to cause a high thermal gradient in the molten pool, resulting in a subsequent generation of porosity and segregation of alloying elements. As a new alternative solution to this challenge, laser beam shaping additive manufacturing technology can improve printing efficiency and printed component quality by modulating the laser beam energy distribution. This project will focus on investigating novel laser beam shaping additive manufacturing technology and explore the potential applications in manufacturing critical high performance components for offshore, oil and gas, nuclear and aerospace sectors.
This research includes publishing SCI papers, specifically covering:
1. Construct a numerical model of thermal-fluid behavior to understand the laser beam shaping additive manufacturing process.
2. Design and printing 3D components with metallic feedstock, e.g. 316L, titanium alloy, Inconel alloy.
3. Characterize microstructure of printed components and evaluate the mechanical properties of the printed components.
4. Data analysis and discussion on mechanisms.
5. Writing and publishing papers.

- **Project 6: Narrow gap laser welding of ultra-thick section high strength steel**
- Project length: 6 to 12 months
- Project Content：

Advanced welding techniques for joining structural materials are gaining increasing importance for strategic applications in nuclear, aerospace, oil and gas, and offshore sectors. Narrow gap laser welding technique is one such advanced welding technique owing to its fabricate-ability of ultra-thick section materials at high welding speeds. This project will focus on investigation of narrow gap laser welding of ultra-thick section (up to 200 mm) high strength steel with flux cored filler wire. This research includes publishing SCI papers, specifically covering:
1. Construct a numerical model to understand droplet transfer of the fluxed cored filler wire during laser welding process.
2. Optimize the narrow gap laser welding parameters.
3. Characterize microstructure of welded joint and evaluate the mechanical properties of the welded joint.
4. Data analysis and discussion on mechanisms.
5. Writing and publishing papers.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- **Project 7:** **Machine Vision and Intelligent Inspection by Deep learning**
- Project length: 6 to 12 months
- Project Content:

Based on the demand for product quality in the industrial field, develop machine learning based detection algorithms and software, verify the effectiveness of the technology through experiments, and publish SCI papers , including:
1. Design of machine vision inspection system.
2. Research on deep learning object detection and semantic segmentation algorithms.
3. Create an industrial surface defect dataset and train detection models.
4. Development of industrial product surface defect detection software.
5. Experimental and validation, development tools include: Python, C++.
6. Writing and publishing papers.

- Supervisor:

Prof. Dr. Wenyong Yu is currently an Associate Professor with School of Mechanical Science and Engineering in Huazhong University of Science and Technology, IEEE Senior Member. His research interest is mainly focused on machine vision, intelligent optical inspection technology and applications. He has published over ten peer-reviewed papers in IEEE Series Journals, including IEEE TII, IEEE TASE, IEEE TIM, IEEE TCSVT and so on. He now is in changing of more than 3 research projects including National Natural Science Foundation of China, sub-tasks of National key research and development plan project of China.

- Supervisor:

Prof. Dr. Gao Yuan is currently a Professor at the School of Mechanical Science and Engineering, Huazhong University of Science and Technology. He has been selected into the National Overseas High-level Talent Program. His main research directions are the transport mechanism of liquids under nano-confinement, the coupling mechanism of nanomechanics and phonon heat transfer, and the diffusion-convection-reaction coupling mechanism in the advanced manufacturing process of polymers. He has published more than 20 papers as the first or corresponding author in journals such as Proc. Natl. Acad. Sci., Phys. Rev. Lett., Matter, Adv. Mater., ACS Nano, Nano Lett., etc. He is currently in charge of scientific research projects such as the National Natural Science Foundation of China.

- **Project 8:** **Computational Design on Thermal Transport Properties in Nanoelectronics based on Low-Dimensional Materials**
- Project length: 6 to 12 months
- Project Content:

Two-dimensional materials like graphene and transition metal dichalcogenides (TMDs) are considered materials for next-generation nanoelectronics, given their extraordinary thermal and electronic properties. However, the boosting power density and heat flux density are associated with more pronounced Joule heating effects. High temperatures will limit the performance, lifetime, and reliability of electronic devices. Heat dissipation and thermal management are the long-term challenges to high-performance nanoelectronic devices. The current project focuses on improving the thermal transport properties of materials and heterojunctions at the nanoscale by computational structural design. The project will utilize molecular dynamics (MD), finite element analyses (FEA), and artificial intelligence (AI) methods to investigate and optimize the phononic thermal transport properties of graphene and its heterostructures. The numerical results will be validated by experiments. The outcome of this project will be published in a scientific article. The content of this project includes:
1. Calculating phononic thermal transport properties with MD.
2. Analyzing phonon properties with dynamics and phonon theories.
3. Conducting AI-aided structural optimization with computational data.
4. Analyzing the performance of optimized device with FEA.
5. Writing and publishing scientific articles.

- **Project 9:** **Computational Study on Confined Masstransport in Mesopores of Membrane Electrode Assembly**
- Project length: 6 to 12 months
- Project Content:

Membrane electrode assembly (MEA) is the core component of fuel cell. The performance of MEA is of vital importance to the electrochemical performance of the fuel cell. Understanding the complex multi-phase mass transport in the mesopores of MEA is the foundation for the design of MEA. Traditional modeling methods based on fluid dynamics and phase field is challenged by the computational cost given the complex structures of the meso pores. This project focuses on developing a lattice Boltzmann (LB) model for the mesopores in MEA and investigating the multiphase mass transport subjected to the confinement environment. The major tasks of the project include:
1. Construct a numerical model of the mesopores in MEA.
2. Conduct fluid analyses with LB method.
3. Establish the relationship between the mass transport properties and the structure of mesopores.
4. Write and publish scientic paper.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- **Project 10:** Soft Wearable Sensing Technology for Human Motion Monitoring

- Project length: 6 to 12 months
- Project Content:

Exoskeleton, as the device to repair and enhance human motion, has important applications in the industrial, medical and military fields. However, exoskeleton cannot coordinate ideally with the human body due to the lack of feedback on the parameters of human motion, leading to high human-machine interaction and even damage to the human body. How to accurately monitor human motion parameters in real time without affecting the normal movement of the human body is the key to realize the assistance function of the exoskeleton. This project is to develop the synchronous sensing networks for multiple motion parameters of the human body using flexible electronic and biomechanical modeling. Based on the Opensim simulation and artificial intelligence algorithm, experiments including gait pattern classification and human body gesture prediction are carried out to verify the reliability of sensing technology. The results will be concluded for the publication of scientific articles. The content of the project includes:

1. Sensing model design and mechanical simulation.
2. Fabrication design of the sensor.
3. Establishment of wireless transmission network for the sensing nodes.
4. Gait motion experiment and gesture prediction.
5. Writing and publishing scientific articles.

- Supervisor:

Guo Jiajie is a professor and doctoral supervisor at Huazhong University of Science and Technology. He received a bachelor's degree in Mechanics from Peking University and a doctoral degree in Mechanical Engineering from Georgia Institute of Technology in the United States. He conducts research on the biomechanical modeling and intelligent sensing of human-centered robots and flexible musculoskeletal systems, which are funded by the National Natural Science Foundation and Key R&D Program. He has published one English textbook with Springer Nature and over 50 academic peer-reviewed papers, and have been granted more than 10 invention patents/software copyrights. He serves as a member of the Technical Transformation and Industry Promotion Professional Committee of the Chinese Rehabilitation Medicine Association, editorial board member of international journals such as Shock and Vibrations, Plos One, Int. J. Intelligent Robotics and Applications, and IEEE/ASME Int. Conf. Advanced Intelligent Mechatronics International Conference.

- **Project 11:** Optical Nanoscopy and Diffraction Holography Lithography

- Project length: 6 to 12 months
- Project Content:

We focus on the areas of developing advanced optical imaging and metrology systems as well as novel optical lithography techniques for integrated circuits, new energy systems, and consumer electronics. The content of this project includes:

1. Full-wave EM modeling and simulation.
2. Conducting experiments based on in-house developed optical imaging and metrology systems.
3. Cooperating with engineers to develop product prototype.
4. Writing and publishing scientific articles and patents.

- Supervisor:

Jinlong Zhu received his BS degree and PhD in Mechatronic Engineering from Huazhong university of Science and Technology in 2015. From 2015 to 2020, he worked as postdoctoral researcher at the University of Illinois at Urbana-Champaign until he started his appointment of Professor with Huazhong University of Science and Technology in 2021. He conducts research in basic science and engineering at the intersection of optical physics, nanodevices, semiconductor IC chips, and machine learning. He is particularly interested in the application of tools, knowledge and insights from photonics, nanoscience and physics to the design of optical imaging instruments and photoelectronic integrated systems for the noninvasive exploration of nanoworld.

- **Project 12:** Genetic Programming for Job Shop Scheduling

- Project length: 3 to 6 months
- Project Content:

Designing effective scheduling rules or heuristics for a manufacturing system such as job shops is not a trivial task. In the early stage, scheduling experts rely on their experiences to develop dispatching rules and further improve them through trials-and-errors, sometimes with the help of computer simulations. In recent years, automated design approaches have been applied to develop effective dispatching rules for job shop scheduling (JSS). Genetic programming (GP) is currently the most popular approach for this task. The goal of this project is to summarise existing studies in this field to provide an overall picture to interested researchers. Then, the demonstration of some recent ideas to enhance the effectiveness of GP for JSS problem needs to be done.

- Supervisor:

Chunjiang Zhang, Ph.D., is a lecturer in the School of Mechanical Science and Engineering, Huazhong University of Science and Technology. He received his B.S. and Ph.D. degrees from Huazhong University of Science and Technology in June 2011 and December 2016, respectively. He was a joint Ph.D. student at the National University of Singapore. He was also a postdoctoral fellow at Nanyang Technological University and Huazhong University of Science and Technology. He is mainly engaged in the research of intelligent optimization algorithms and the theory and methods of intelligent shop floor scheduling. He presided over two National Natural Science Foundation of China projects and one sub-project of National Key Research and Development Program of China. He has published more than 30 papers in IEEE Transactions on Cybernetics, Robotics and Computer-Integrated Manufacturing and other SCI journals, co-authored one monograph (ranked 2nd), applied for 5 invention patents and registered 4 software copyrights.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- **Project 13: High-speed, large-scale thin film/solar cell fabrication**
- **Project length: 6 to 12 months**
- **Project Content:**

According to the needs of photoelectric thin films for solar cells, we developed high-performance conductive semiconductor deposition materials and deposition processes, verified the effectiveness of materials and processes based on the device platform, and published SCI papers, including:

1. Design of composition and function of photovoltaic thin film of solar cells.
2 Atomic Layer Deposition (ALD) thin film deposition process development.
3. Large-area rapid manufacturing of film uniformity and performance verification.
4 Experimental verification of solar cell 5 devices.
5. Writing and publishing papers.

- **Supervisor:**

Dr. Fan Yang, associate professor, whose main research field is gas phase atomic layer deposition process and micro-nano manufacturing equipment. Prof. Fan Yang published a number of SCI papers in domestic and foreign journals, related research results have been widely concerned and cited by authoritative experts at home and abroad. Prof. Fan Yang presided over the national key research and development program, the National Natural Science Foundation of China and the Hubei Provincial Natural Science Foundation and many other scientific research projects.

- **Project 14: Ultralow platinum loading membrane electrode assembly for hydrogen fuel cell**

- **Project length: 6 to 12 months**
- **Project Content:**

The hydrogen fuel cell is facing an urgent need for the reduction of precious metal usage. In order to overcome the issues such as poor stability, high mass transfer impedance and demanding operational control faced by low noble metal catalysts, research is conducted on the design and preparation of ultra-low platinum fuel cell catalyst layers with micro-nanostructures. This research includes publishing SCI papers, specifically covering:

1. Preparation and surface atomic-level modification of low-platinum catalysts.
2. Design and preparation of catalyst layer micro-nanostructures.
3. Assembly of membrane electrodes and evaluation of cell performance under operational conditions.
4. Data analysis and discussion on mechanisms.
5. Writing and publishing papers.

- **Supervisor:**

Dr. Xiao Liu, associate professor, whose research interests are focused on particle atomic layer deposition and the rational design and controllable synthesis of environment and energy-related materials. He has published more than 50 papers in refereed journals, such as Nature Communication, Angewandte Chemie International Edition, International Journal of Extreme Manufacturing, and so on. Now, he has presided over the National Natural Science Foundation general projects, youth projects, National Key R&D Program projects, and Postdoctoral Innovative Talents Support Program, among others. He has won Postdoctoral Innovative Talents Support Program Innovation Achievement Award, First Prize for Technological Invention in Hubei Province and Provincial Patent Award from Hubei Province.

- **Project 15: Intravital Multiphoton Microscopy Imaging for Tumor Diagnosis and Microenvironment Research**
- **Project length: 6 to 12 months**
- **Project Content:**

Focused on the urgent need for fast imaging of tumor microenvironment in clinical cancer diagnosis and scientific research, the project investigates a label-free multi-channel in vivo multiphoton microscopy platform. Addressing challenges such as weak signals from unlabeled imaging, aberrations and scattering in biological tissue imaging, we will develop adaptive optics techniques to correct for aberration and scattering based on wavefront engineering and computational optics techniques. This includes the development of an advanced multiphoton microscopy with medical imaging experimental validation, and the publication of high-level SCI papers. Specific areas include:

1. Optical design of a large field-of-view, multi-channel multiphoton microscopy systems.
2. Implement control and data acquisition for the high-speed multiphoton microscopy systems.
3. Optimize system point spread function based on wavefront engineering and computational optics techniques.
4. Imaging of medical specimens and data analysis.
5. Writing and publishing papers.

- **Supervisor:**

Prof. CHEN Wei received both his B.S. and M.S. in Optics from Huazhong University of Science & Technology (HUST) in 2010 and 2012, respectively. He received his Ph.D. in Biomedical Engineering from Stony Brook University, New York, in 2018. He worked as a postdoctoral fellow at the Janella Research Campus (HHMI) for 6 months before moving to UC Berkeley to continue his postdoctoral training under the supervision of Prof. Na Ji from 2018 to 2023. In 2023, he returned to HUST to join the School of Mechanical Science and Engineering as a Professor. Prof. Chen's research is focused on AI-empowered advanced optical microscopy, computational optics, neurophotonics and medical instruments. He has also published multiple high-quality papers in top-tier journals such as "Nature Methods", "Nature Neuroscience", "Nature Communications", "Cell Metabolism", "Molecular Psychiatry", and "eLife", and holds one U.S. patent.

HUST Scientific Research Internship Program

School of Mechanical Science and Engineering

- **Project 16: Perception, Planning and Control of Robotic Arms Equipped with Dexterous Hands on Long Sequence Multi-Objective Tasks**
- Project length: 6 to 12 months
- Project Content:

To develop a dexterous hand-equipped robotic arm perception, planning control system for long sequence multi-objective tasks in scenarios such as assembly. Design a novel perceptual planning control method for long sequence multi-objective tasks in a simulation environment, verify the effectiveness of the perceptual planning control method on a physical platform of a dexterous hand-equipped robotic arm, and publish an SCI paper, which includes:

1. Long-sequence multi-objective task design for specific task scenarios.
2. Research on goal-oriented reinforcement learning method and imitation learning method.
3. Developing a dexterous hand-equipped robotic arm perception, planning and control method for specific long-sequence multi-objective tasks.
4. Testing and debugging the perceptual planning control method on a physical platform of a robot arm equipped with a dexterous hand.
5. Simulation experiments and physical platform validation, development tools include: python, C++, ROS, pybullet.
6. Write and publish papers.

- **Supervisor:**

Professor Xiangrui Zeng was born in February 1987 and received his B.S and M.S. degree from Tsinghua University in 2009 and 2012 respectively. He received his Ph.D. from The Ohio State University in 2016. Zeng worked for Ford Motor Company as a Data Scientist from October 2016 to December 2019. He worked as a Tenure-Track Assistant Professor in the Robotics Engineering Department and the Mechanical Engineering Department at Worcester Polytechnic Institute from January 2020 to June 2021. In July 2021, Prof. Zeng joined the School of Mechanical Science and Engineering of Huazhong University of Science and Technology. Prof. Zeng's research focuses on connected and automated vehicles as well as connected vehicle network big data analysis and applications. He has published more than 20 SCI/EI papers on journals and conferences including Applied Energy, IEEE Transactions on Control Systems Technology, etc. He has applied five U.S. patents. He is an associated editor for Mechatronics, and he served as a guest editor for IEEE/ASME Transactions on Mechatronics. He is a reviewer for more than 20 journals and conferences including IEEE Transactions on Control Systems Technology, and IEEE Transactions on Vehicular Technology, etc. Prof. Zeng has organized multiple sessions in ACC, ASME DSCC, IEEE/ASME AIM, IEEE AI4I, MECC and SAE WCX. He is a member of the Technical Committee on Intelligent Control for the IEEE Control System Society, and a member of the SAE Automobile Electronics Activity.

- **Project 17: Structured Intelligent Design Methods and Technologies**
- Project length: 6 to 12 months
- Project Content:

Based on the demand for product structural design in the manufacturing industry, our objectives are developing intelligent design methods and software based on machine learning/deep learning, validating their effectiveness via engineering models, publishing SCI papers, which includes:

1. Constructing geometric design and analysis models for complex engineering parts.
2. Researching on efficient algorithms for geometric analysis and optimization.
3. Collecting datasets for engineering structural analysis and optimization, and training solving models.
4. Developing deep learning algorithms and software for geometric analysis and optimization.
5. Validating engineering part models, while the development languages and tools include Matlab, Python, C/C++/CUDA.
6. Writing and publishing papers.

- **Supervisor:**

Dr. Zhaohui Xia, Associate Professor at Huazhong University of Science and Technology, serves as the Chief Scientist for the National Key Research and Development Program for Young Scientists. With a background in CAD/CAE digital design core algorithm and software development, Dr. Xia conducted postdoctoral research at Rensselaer Polytechnic Institute in the United States and collaborated with Beth Israel Deaconess Medical Center (BIDMC) of Harvard University on interdisciplinary clinical research in medical engineering.

His research primarily focuses on the integration of CAD/CAE design-analysis-optimization methods and industrial software technologies. Dr. Xia has published over 30 SCI papers in authoritative journals such as Computer Methods in Applied Mechanics and Engineering and the International Journal of Mechanical Sciences, with one highly cited paper in the Essential Science Indicators (ESI). He also serves as a reviewer for multiple SCI journals including CMES - Computer Modeling in Engineering and Engineering Structures. Dr. Xia has led and participated in various national research projects, including the National Key Research and Development Program, the Ministry of Industry and Information Technology's High-Quality Special Program, the National Natural Science Foundation of China's Youth Fund, sub-tasks of national key R&D projects, and funding from national key laboratories.

HUST Scientific Research Internship Program

Electrical and Electronic Engineering

School of Electrical and Electronic Engineering HUST

- **Project 1:** **Evaluating Non-Euclidean Geometries of Stability Regions of Electric Power Grids under High Variability of Renewable Energy**
- **Project length: 12 months**
- **Project Content:**

Due to the intermittent feature and the large spatial dispersion of the renewable energy, the near future electric energy systems are expected to work at a huge number of different modes with large variability. This situation brings a great complexity challenge to the traditional operational methods which heavily rely on good predictions and a few typical system changing directions. This project aims to apply differential geometry methods to address this challenge. Instead of analyzing each single operating point, we focus on the global features of all the possible stable operating points, together forming a nonlinear stability region. Staying away from the boundary of this region can guarantee a safe operation, which relieves us from repeatedly checking stability for each single scenario. Thus, we are particularly interested in (1) how far away the existing operating point is from the stability boundary; (2) what the basic geometric properties this region and its boundary have; and (3) how to efficiently evaluate these properties by geometric and computational methods.

- **Supervisor:**

Prof. Dr. Dan Wu is currently a professor in the School of Electrical and Electronic Engineering at Huazhong University of Science and Technology. Dr. Wu's research interests lie in the areas of nonlinear dynamics and optimization, electric power systems, natural gas networks, interdependent complex systems, and geometric and topological methods in engineering applications. He has published several peer-reviewed research papers in top-tier journals and has served as invited guest editors. He has also presented his research at various international conferences and has served as conference panel chairs. He actively collaborates with researchers and industry professionals all over the world (Germany, US, Singapore, etc.) to solve real-world problems and create innovative solutions that make a positive social impact.

- **Project 2:** **Advanced Permanent Magnet Linear Oscillation Machine and Drive System for Linear Compressor**
- **Project length: 12 months**
- **Project Content:**

In view of the low efficiency and reliability of the traditional linear compressor, this project proposes a new linear oscillatory machine and its compression system. Main work of this project can be summarized as: (1) Proposed a topology of the transverse flux stator permanent magnet linear oscillatory machine, and clarified the influence of key structure on electromagnetic parameters. (2) Analyzed the heat transfer mechanism of “motor load cylinder”, and deducecd the mathematical relationship between temperature distribution and electromechanical load. (3) Established the mapping relationship between the load and the system resonant frequency under different working conditions, and proposed a high-performance resonant frequency control strategy. (4) Established the system level multi-level linear compressor optimization model, proposed the decomposition and coordination optimization design method of multi-coupled system. This project can effectively promote the rapid development of the compressor industry, which has great theoretical research value and broad application prospects.

- **Supervisor:**

Prof. Dr. Wei Xu is currently a professor with School of Electrical and Electronic Engineering in Huazhong University of Science and Technology. His research interest is mainly focused on motor design, control, and system integration applications. Prof. Xu has published over 160 peer-reviewed papers in IEEE Series Journals, including IEEE TIE、IEEE TPEL、IEEE TVT、IEEE TEC、IEEE TIA and so on. He was elected for National High-level Young Talent Program of China, IET Fellow, One-Hundred Outstanding Talent Program in Hubei Province, etc.

HUST Scientific Research Internship Program

Clean and Renewable Energy

China-EU Institute for Clean and Renewable Energy

- **Project 1: Design and fabrication of perovskite/silicon tandem solar cells**
- **Project length: 6-12 months**
- **Project Content:**

The main research contents of Prof. Wang Mingkui's team are as follows: Nowadays, perovskite/silicon tandem solar cells have emerged as an innovative photovoltaic technology that has garnered global interest from researchers, given its remarkable efficiency record of 33.7%. Nevertheless, we believe there remains significant untapped potential in the materials and device architecture that can be optimized further, with the possibility of approaching the theoretical efficiency benchmark of approximately 45%. The purpose of this project is to design and fabricate high-efficiency perovskite/silicon tandem solar cells, using a systematic and innovative approach. The project will leverage the principle of material science, photovoltaics, and nanotechnology, in a hands-on, laboratory setting.

- **Supervisor:**

Prof. Wang Mingkui, from China-EU Institute for Clean and Renewable Energy, Ph. D. Supervisor of Wuhan National Laboratory for Optoelectronics, FRSC, Clarivate 2019 Highly Cited Researcher.

- **Project 3: High-Efficient Green Hydrogen Production and Storage**
- **Project length: 3-6 months**
- **Project Content:**

The main research contents of Associate Prof. LI Song is focused on the development and design of key materials and parts for high-efficient hydrogen production and storage powered by renewable energy, exploration of the mechanism for improved performance as well as system packing, design and management by integrated experimental and theoretical approaches. The research interests of Li's Lab include hydrogen production, storage and utilization by molecular simulation, machine learning, thermodynamics and experimental techniques.

- **Supervisor:**

Associate Prof. LI Song, from China-EU Institute for Clean and Renewable Energy and Department of New Energy and Science at the School of Energy and Power Engineering at Huazhong University of Science and Technology. She obtained her PhD in Chemical Engineering from Vanderbilt University at USA in 2014, followed by a postdoctoral study in Prof. Randall Snurr Group of Northwestern University.

- **Project 2: Solar fuels production**
- **Project length: 6-12 months**
- **Project Content:**

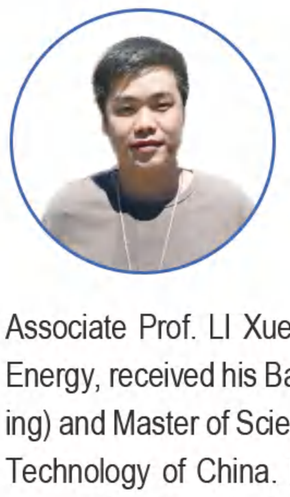
The main research of Associate Prof. Zeng Kuo's team are follows: The fundamental research focus comprises high-temperature heat/mass transfer phenomena and multi-phase reacting flows, with applications in solar power and fuels production, decarbonization and CO2 capture and recycling, energy storage and sustainable energy systems.

- **Supervisor:**

Associate Prof. Zeng Kuo, from China-EU Institute for Clean and Renewable Energy and School of Energy and Power Engineering, doctor of the French National Center for Scientific Research

- **Project 4: Wind resource analysis and wind farm design**
- **Project length: 12 months**
- **Project Content:**

The main research contents of Associate Prof. LI Xuemin is aimed to develop a GUI program, which has the following abilities: Wind resource analysis : history data analysis and short time prediction; Wind turbine wake model : develop a program for wind turbine wake model; Wind farm design : turbine model, farm layout design, calculate AEP for wind farm; Wind farm optimal layout design : using genetical algorithms method to get optimal layout.
Requirements: GUI developing using Matlab or Python or C++



- **Supervisor:**

Associate Prof. LI Xuemin, from China-EU Institute for Clean and Renewable Energy, received his Bachelor of Science (Mechanics and Mechanical Engineering) and Master of Science (Fluid Mechanics) from the University of Science and Technology of China. In 2007, he received his Ph.D. from the Department of Mechanical Engineering (Computational Aerodynamics) of the Hong Kong Polytechnic University. The main research topics include fluid mechanics, internal flow analysis, aeroacoustics, and wind energy utilization technology.

HUST Scientific Research Internship Program

Clean and Renewable Energy

China-EU Institute for Clean and Renewable Energy

- **Project 5: Biomass conversion to biofuel and its technical and economic analysis**
- **Project length: 12 months**
- **Project Content:**

The main research contents of Associate Prof. Jiang Long's team are as follows:
Among all types of new energy sources, biomass energy is the only carbon-containing renewable energy. It can be produced on a large scale similar to coal, oil, natural gas, and other fossil fuels, and can be used to prepare green liquid fuels or chemical raw materials. With its low sulfur, low nitrogen, and carbon-neutral characteristics, biomass energy holds tremendous potential in replacing traditional fossil fuels and addressing energy and environmental challenges. The team's research interests encompass several key areas, including biomass pyrolysis to produce bio-oil, the upgrading of bio-oil into bio-jet fuels, biomass gasification for renewable hydrogen production, and the synthesis of low-carbon alcohols, and the 3E (energy, economic and environment) analysis of these thermochemical processes. The funding for these projects is provided by several sources, including the National Natural Science Foundation of China, the National Key Research and Development Program, as well as contributions from various enterprises.

- **Supervisor:**

Associate Prof. Jiang Long, from China-EU Institute for Clean and Renewable Energy, and New Energy Science and Engineering at the School of Energy and Power Engineering, doctor of Huazhong University of Science and Technology, postdoctoral fellow of King Abdullah University of Science and Technology.

- **Project 6: System design and numerical analysis of supercritical CO2 cycle for power generation and energy storage**
- **Project length: 12 months**
- **Project Content:**

The main research contents of Associate Prof. Xu's team are as follows: Supercritical carbon dioxide (S-CO2) power cycle system uses S-CO2 instead of water/steam to realize heat transfer and power generation. It is a new kind of power cycle system and considered as a transformative technology in the energy sector due to its high efficiency, simple turbomachinery and high power density. Besides, the S-CO2 power cycle system is also considered as a good choice for energy storage, solving the instability of solar and wind energy. However, the concept designs of S-CO2 coal-fired power plant, energy storage system and their coupled system are still in the infancy stage. This collaboration aims to build the optimal system designs and conduct the quantitative economic analysis of the systems by numerical tools.

- **Supervisor:**

Associate Prof. Xu Jun, from China-EU Institute for Clean and Renewable Energy, doctor and postdoctoral fellow, conducts research in Energy conversion and efficiency at the School of Energy and Power Engineering. He now is in changing of more than 5 research projects including one National Natural Science Foundation of China, two sub-tasks of National key research and development plan project of China.

HUST Scientific Research Internship Program

Life Science and Technology

School of Life Sciences and Technology

- **Project 1: Allosteric modulation of GABAB receptor complex**
- **Project length: 1-12 months**
- **Project Content:**

GABAB receptor is the metabotropic G protein-coupled receptor which binds the inhibitory neurotransmitter γ-aminobutyric acid (GABA). It regulates diverse function in central nervous system and peripheral system. At present, the research on GABAB receptor mainly focuses on the heterodimer composed of GB1 and GB2, but GABAB receptor can also form complex with other proteins to regulate the functional diversity. This project is aimed to explore the new GABAB receptor complex and its allosteric regulation mechanism in different tissues or cells by developing new tools using specific nanobodies. Meanwhile the signal transmission network of GABAB receptor complex will be investigated in both physiological and pathological condition.

- **Supervisor:**

Prof. Jianfeng Liu is the director of Key Laboratory of Molecular Biophysics of MOE, and the dean of College of Life Science and Technology in Huazhong University of Science and Technology. His laboratory mainly focus on the structure and function of membrane receptors, including G protein coupled receptor (GPCR) and ion channel, as well as the physiological outputs of those receptors, and the molecular pharmacology research on those receptors; In addition, using C.elegans as a model the regulatory mechanism of those membrane receptors on aging and aging related diseases is investigated. He has published more than 60 papers in journals including Cell (2 papers), Nature (2 papers), Nature Chemical Biology (2 papers), Nature Communications (4 papers), Cell Research (2 papers), Science Advances, EMBO Journal、PNAS and so on, with more than 4500 citations.

- **Project 3: Transactivation mechanism of melatonin MT2 and serotonin 5-HT2C receptor heteromers**
- **Project length: 1-12 months**
- **Project Content:**

Previous evidences have defined the functional fingerprint of heteromers composed of Gi-coupled melatonin MT2 receptors and Gq-coupled serotonin 5-HT2C receptors, in which melatonin transactivates phospholipase C (PLC) through 5-HT2C. This project aims to decode the signaling of a MT2/5-HT2CR Heteromeric Complex, and will provide valuable insights for the signaling properties of GPCR heteromers.

- **Supervisor:**

Dr. Ping Yi, Associate professor in the School of Life Science and Technology in Huazhong University of Science and Technology. Research interest is mainly focused on signal transduction of G protein-coupled receptors (GPCRs); and mechanism and physio-pathological significance of endoplasmic reticulum stress. Key Laboratory of Molecular Biophysics, Ministry of Education.

- **Project 2: Mechanistic investigation of the ER stress sensor IRE1α in endothelial cell dysfunction**
- **Project length: 1-12 months**
- **Project Content:**

This project aims to employ our successfully created ECKO mice with EC-specific IRE1α knockout and investigate:1) how IRE1α pathway in ECs regulates injury-induced vascular re-endothelialization and neointimal formation; 2) the mechanisms by which the IRE1α pathway in ECs regulates the pathogenic progression of atherosclerosis in the context of ApoE deficiency. These studies will not only determine the molecular basis of IRE1α regulation of vascular homeostasis, but also elucidate the pathophysiological role of IRE1α in EC dysfunctions. Our results may provide new targets for the therapeutic intervention against atherosclerosis and related vascular disorders.

- **Supervisor:**

Dr. Jianmiao Liu has been a Research Scientist (Permanent position (IR)) at the French National Center for Scientific Research (CNRS) since 2008. She received the Distinguished Professorship of "Hubei Chutian Scholars" from Hubei Province and joined Huazhong University of Science and Technology (HUST) in 2010 as a full professor at the College of Life Science and Technology. Prof. Liu focuses on the role of endoplasmic reticulum stress response in cardiovascular diseases. Employing genetic animal models, her research aims to elucidate the molecular and cellular mechanism by which the unfolded protein response (UPR) pathways in ER stress, particularly the IRE1 branch, regulate the function of endothelial cells. She also investigates the effects of shear stress on endothelial cell function using microfluidic technology. Our recent work has been published in Nat. Metab., J Clin Invest, J. Biol. Chem., Cell Death Differ., Nat. Immunol., Biomacromolecules and Lab Chip, etc.

- **Project 4: Phage assisted directed evolution to improve nanobody affinity maturation**
- **Project length: 1-12 months**
- **Project Content:**

Nanobodies are the recombinant variable domains of heavy-chain-only antibodies, with overwhelmingly advantages such as small size, excellent solubility, superior stability, ease of manufacture, quick clearance from blood, and deep tissue penetration. The binding affinity of the nanobodies is of critical importance for its applications, while many of them lack high affinities. This project aims to significantly improve the binding affinity of the nanobody with phage assisted directed evolution. Based on theoretical modelling and rational design, the project seeks to build smart phage display libraries with high diversity which evolve in designed manner. The outcomes are expected to improve the binding affinities of the nanobodies to nanomolar or picomolar, thus largely extending their applications as therapeutic tools.

- **Supervisor:**

Associate Prof. Dr. Huan Peng is currently an associate professor in the School of Life Science and Technology in Huazhong University of Science and Technology. His research interest is mainly focused on next-generation phage display technology and phage therapy. Prof. Peng has published more than 20 papers in peer-reviewed journals such as PNAS, Current Biology, ACS Nano, and filed 2 PCT patents.

Key Laboratory of Molecular Biophysics, Ministry of Education

HUST Scientific Research Internship Program

Life Science and Technology

School of Life Sciences and Technology

- **Project 5:** **Biosensor development to detect the activation of native GPCRs in neurons**
- Project length: 1-12 months
- Project Content:

GPCRs constitute the largest family of membrane proteins and the most important drug targets. The discovery of drugs targeting these receptors and their G protein signaling properties are based on assays mainly performed with recombinant, often modified receptors expressed in heterologous cells. However, GPCR response may differ in native environments because multiple factors can influence them. It remains challenging to monitor the coupling of the endogenous GPCRs to a specific G protein expressed at physiological level. This project aims to developed biosensor for different G proteins that allow the detection of endogenous GPCR activity in living neurons.

- Supervisor:

Dr. Chanjuan XU is currently an associated researcher in College of Life Science and Technology, Huazhong University of Science and Technology. She works on the molecular pharmacology and signaling of G protein-coupled receptors (GPCRs), as well as the assay development of GPCR functional detection. She has published papers as co-first author or co-corresponding author in Nature (2 papers), Nature Chemical Biology, Cell Research, Science Signaling and so on.

- **Project 6:** **Aging and longevity regulation by ambient temperature via histone methylation in C.elegans**
- Project length: 1-12 months
- Project Content:

This project aims to address the challenges in determination the pivotal role of histone methylation in aging and longevity regulation by ambient temperature. Firstly, taking C.elegans, a classic model organism, as experimental subjects, the underlying mechanisms for environmental temperature to reshape aging and longevity via histone methylation would be comprehensively tested and confirmed. Secondly, the relative cellular and molecular networks would be investigated and identified. Thirdly, the evolutionary conservation of key factors of these networks would be intensively explored in mammalian systems. Last but no least, potential anti-aging drugs targeting histone methyltransferase and demethylase would be checked or developed.

- Supervisor:

Dr. Bi Zhang is currently a lecturer in the College of Life Science and Technology in Huazhong University of Science and Technology. His research interest is mainly focused on regulatory mechanism underlying aging and longevity. Dr.Zhang has published more than ten peer reviewed paper in Nature aging, Genes & Development, Cell reports and so on. He has been in charged of two grants from NSFC for exploring the answers to how aging and longevity are regulated by coordination of environmental factors and genetical pathways.

- **Project 7:** **G protein coupled receptors of neurotransmitters modulate aging via a temporal and spatial manner**
- Project length: 1-12 months
- Project Content:

Neurotransmitters and their G protein coupled receptors (GPCR) play important roles in aging modulation. Exploration of the cellular and molecular mechanisms underlying neurotransmitters and aging is critical for anti-aging therapy. According to the most recent data, the effect of anti-aging modulation largely depends on the context of age-related physiological state. Importantly, the expression level and activity of neurotransmitters change with age. Meanwhile, their synthesis sites and receptors expression profiles are tissue specific. It is helpful for geroscience to research the temporal and spatial modulation of aging via neurotransmitters and their GPCRs, which is still largely unknown. In this project, we plan to construct the auxin-inducible degradation (AID) system to modulate the expression level of specific neurotransmitters in C.elegans. Then we will identify when and where the neurotransmitters and their GPCRs exert their function in aging modulation and the underlying mechanism. The evolutional conservation of these GPCR targets will be confirmed in the mammalian system. We try to develop the anti-aging strategies and small molecules targeted the GPCR candidates based on the temporal and spatial clues. This project will advance the understanding of effect of neuroendocrine system on aging, which is helpful for the identifying of the novel anti-aging strategies and targets.

- Supervisor:

Dr. Lei Chun is currently an associate professor in the College of Life Science and Technology in Huazhong University of Science and Technology. Her research interest is mainly focused on neurotransmitters and aging. Dr. Chun has published several papers in Nature Communications, Cell Reports, iScience, American Journal of Physiology-Cell Physiology and so on. She was received the first prize of Hubei Province Natural Science Award as the third author.

HUST Scientific Research Internship Program

Energy and Life Science

School of Life Sciences and Technology

- **Project 8:** Prof. Zifu Li's lab
- Project length: 1 month
- Project Content:

The main research contents of Prof. Li Zifu's team are as follows: Prof. Li Zifu's lab is based on the National Engineering Research Center for Nanomedicine at Huazhong University of Science and Technology. His research lies at the interface of biomaterials, drug delivery, and cellular and molecular bioengineering to fundamentally understand and therapeutically target biological molecules, cancer cells, immune cells and cancer stem cells. We apply our research findings and the technologies developed to a range of human health applications, particularly on cancer diagnosis and treatment. Prof. Li Zifu's team is focused on: mechano-nanooncology; hyperbaric oxygen therapy-based cancer treatment; and smart nanomedicine.

- Supervisor:

Prof. Li Zifu, doctor of the Chinese University of Hong Kong, Ph.D. supervisor of the School of Life Sciences and Technology, was selected into the leading academic youth team of Huazhong University of Science and Technology (head of the Mechanonanooncology team).

- **Project 9:** Dual-mode activatable second near-infrared fluorescence and magnetic resonance probes for evaluation of microglia in post-ischemic stroke murine model
- Project length: 12 months
- Project Content:

The main research contents of Associate Prof. Zhang Yan's team are as follows: Design and synthesis of the dual-mode activatable NIR-II and MRI probe, Physiochemical performance evaluation and optimization of the probe, Establish the ischemic stroke mouse model, In vivo evaluation of the probe, Ex vivo confirmation.

- Supervisor:

Prof. Zhang Yan, from the National Nanodrug Engineering Technology Center, doctor and postdoctoral fellow of the School of Chemical and Biomedical Engineering, Nanyang Technological University, Singapore.

- **Project 10:** The antitumor effects of drug loaded microparticles released by cold plasma treated tumor cells
- Project length: 12 months
- Project Content:

The main research contents of Associate Prof. Jiang Xinnong's team are as follows: The mouse hepatocellular carcinoma (HCC) cell line H22 will be treated with cold plasma, and then incubate with sorafenib and/or lapatinib, the small molecule inhibitors of receptor tyrosine kinases, in the incubator. The next day, the drug loaded microparticles (MPs) released by H22 cells will be harvested by centrifugation. The concentration, drug loading amount, drug release curve, and the diameter of MPs will be measured, and the effects of drug loaded MPs on the proliferation, survival, apoptosis, autophage, migration, invasion, tumor growth and metastasis of human and murine HCC, breast cancer, and prostate cancer cell lines will be analyzed. The mechanism will also be investigated.

- Supervisor:

Associate Prof. Jiang Xinnong, from the School of Life Sciences and Technology, postdoctoral fellow of Beth Israel Deaconess Medical Center (BIDMC) of Harvard Medical School, visiting scholar of Etienne Baulieu Academician Laboratory of the French National Institute of Medicine and Health (INSERM).

School of Energy and Power Engineering

- **Project 1:** Biomass gasification with negative carbon emission through innovative CO2 capture and utilisation and integration with energy storage (Biomass-CCU)
- Project length: 12 months
- Project Content:

The main research contents of Prof. Yang Yang's team are as follows: Gasification could be the future major technology to help the EU achieve the net-zero goal by 2050. Converting biomass into gas can reduce the amount of solid waste while generating renewable fuels and energy. In this context, the EU Horizon2020 programme funded the BIOMASS-CCU project that would provide an innovative and economic biomass waste gasification solution for European municipalities, energy production companies and SMEs sectors. The project brings researchers from the EU, China and Australia with a collaborative goal to advance biomass gasification technology by integrating CO2 capture and utilisation with multifunctional catalyst materials. The BIOMASS-CCU consortium also seeks to maximise the environmental benefit of carbon emission, and enhance the economic feasibility by producing high value alkenes from CO2 using conventional and advanced non-thermal catalysis. Through the combination with energy storage and novel heat exchange approaches, energy efficiency of biomass gasification can be significantly enhanced.
This collaboration will build a world-leading team with structured international and intersectoral exchanges involving over 70 researchers to innovate the next generation CCS technology.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 823745.

- Supervisor:

Prof. Yang conducts research in bioenergy and CCS at the State Key Laboratory of Coal Combustion within the School of Energy and Power Engineering. He held Marie Curie ESR Fellowship and he is Chartered Member of IChemE and Member of RSC.

HUST Scientific Research Internship Program

Wuhan National Laboratory for Optoelectronics

- **Project 1:** **Generation and measurement of Attosecond laser**
- Project length: 3 to 6 months
- **Project Content:**

The main research contents of Prof. Lu Peixiang's team are as follows: To carry out experimental research on the generation and measurement of high power attosecond laser. In this project, we will use a terawatt femtosecond laser in combination with a multi-channel laser coherent synthesis scheme to interact with rare gases to generate high-power attosecond pulses. And the generated attosecond laser will be measured and characterized by the attosecond streaking camera technology or the all-optical method. The specific research contents include: (1) the construction of multi-channel (two-color, three-color) femtosecond laser coherent synthesizer and its stability-control system; (2) the construction of attosecond streaking camera equipment; (3) the all-optical measurement of attosecond laser.)

- **Supervisor:**

Prof. Lu Peixiang, Deputy Director of Wuhan National Laboratory for Optoelectronics, distinguished professor of Changjiang Scholars of the Ministry of Education, and winner of the National Science Fund for Distinguished Young Scholars, selected into the National Hundred and Ten Million Talents Project, Fellow of SPIE.

- **Project 2:** **Research on Tissue Optical Imaging and Phototherapy**
- Project length: 1 to 3 months
- **Project Content:**

We would like to welcome students interested in the following areas:

(1) Development of optical methods for studying glycation and hemodynamics of biological tissues in diabetes mellitus

This project aims to develop a biophotonic diagnostic method for assessing the severity of diabetes, exploring differences between healthy and pathological tissues. By studying changes in the structure, function, and microcirculation characteristics of key organs (such as skin, muscles, and brain) during diabetes progression at both in vitro and in vivo levels, and analyzing the internal connections between these changes, we aim to comprehensively understand the overall impact of diabetes on the body. This will provide theoretical support for the development of new diabetes diagnosis programs in the future.

(2) Research of photo-sleep therapy on microglial structure and function in an Alzheimer's Disease mouse model

The aim of this study is to investigate the effects of photo-sleep therapy on the structure and function of microglia in an AD mouse model. This study will employ tissue clearing imaging techniques to continuously track the morphological changes of microglia of AD mice in vivo during photo-sleep therapy period, and measure the expression changes of cytokines related to phagocytosis functions (e.g., TGF-β) and inflammatory response (e.g., iNOS) in the brain. In parallel, this study will assess the potential cognitive improvements induced by photo-sleep therapy in AD mice by conducting Morris water maze and Barnes maze tests, and investigate the correlation between structural and functional changes in microglia and cognitive function through correlative analysis.

- **Supervisor:**

Professor ZHU Dan, Director of the Advanced Biomedical Imaging Facility, Deputy-Director of Wuhan National Laboratory for Optoelectronics, SPIE/OPTICA Fellow.

- **Project 3:** **Study on high efficiency tandem perovskite solar cells**
- Project length: 6 to 12 months
- **Project Content:**

The main research contents of Prof. Tang Jiang's team are as follows:

1.Preparation of wide and narrow band gap perovskite thin films

Based on the structure of ABX3, the band gap of the perovskite material can be adjusted to 1.15 eV and 1.70 eV, respectively, by adjusting the components of the A cation and the X halogen ion. Perovskite films with stable performance and suitable band gap can be prepared by means of spinning coating, thermal evaporation and scraping coating.

2. High efficiency and stability of single perovskite solar cell preparation

Efficient and stable single perovskite solar cells with band gaps of 1.15eV and 1.70eV were prepared respectively to obtain large short circuit current and open circuit voltage, and strive to achieve efficiency of more than 20%, laying a foundation for the preparation of laminate cells.

3.Preparation of perovskite and perovskite laminated cells

(1) Study on interconnect layer between perovskite cell and perovskite cell. RPD and ALD technologies were used to prepare the intermediate junction layer, and the charge loss and transmission process at the intermediate junction layer were studied to obtain the maximum efficiency.

(2) Preparation of perovskite battery and perovskite battery integrated device. Optimized structure design and device fabrication of laminated cells.

- **Supervisor:**

Prof. Tang Jiang, Deputy Director of Wuhan National Laboratory for Optoelectronics, Dean of the School of Optical and Electronic Information, Fellow of Optica, Clarivate Highly Cited Researcher (2019, 2020, 2021, 2022).

HUST Scientific Research Internship Program

Wuhan National Laboratory for Optoelectronics

- **Project 4: Research on silicon based multi-dimensional multiplexing optical communication system**
- Project length: 6 months
- Project Content:

The main research contents of Prof. Wang Jian's team are as follows: After decades of development, the traditional single-mode optical fiber communication has approached its Shannon capacity limit and have begun to have a new capacity crisis. Photons offer multiple physical resource dimensions such as polarization, frequency/wavelength, amplitude, phase, time, etc. The exploration of new dimensions and multi-dimensional integration of photonics is the key to the sustainable expansion of optical communications. Silicon-based integrated photonics has the characteristics of high integration, low power consumption and low cost, which provides a promising platform for the development of optical communication networks. This project studies the key technical issues in multi-dimension multiplexing processing, and realizes the hybrid wavelength-, mode- and polarization-division multiplexing on chip with photonic integrated devices, and realizes the multi-dimension signal processing system of fiber–to–chip–to–fiber.

- Supervisor:

Prof. Wang Jian, Ph.D. Supervisor, Deputy Director of Wuhan National Laboratory for Optoelectronics, Fellow of SPIE and Optica.

- **Project 5: Biochemical sensors based on combination of optical fiber microstructure and new materials**
- Project length: 6 to 10 months
- Project Content:

The main research contents of Prof. Shu Xuewen's team are as follows: To study the preparation of different types of microstructures on optical fibers and the combination of some new materials to achieve biochemical sensors for different detection targets. We will study the preparation technology of microstructures such as femtosecond laser processing, study the methods of integrating various new materials with microstructures, and study the biochemical detection technology of applying these structures and materials to biological molecules, heavy metal ions, gas molecules and other different targets.

- Supervisor:

Prof. Shu Xuewen, Ph.D. Supervisor of Wuhan National Laboratory for Optoelectronics, member of the British Institute of Physics (IOP Fellow), was selected into the national overseas high-level talent introduction plan.

- **Project 6: Materials and fabrication of flexible organic solar cells**
- Project length: 6 months
- Project Content:

The main research contents of Prof. Zhou Yinhua's team are as follows: Organic photovoltaic (OPV) devices have the advantages of easy processing, good mechanical flexibility, light weight. They have been attractive for the applications in energy supply for Internet of Things and other portable energy demands. At present, the efficiency of large-area OPV devices is still low, and the large-area preparation process technology is still not mature. The following research are proposed to be carried out: (1) Development of key materials for large-area flexible OPV devices; (2) Development of large area fabrication technology of flexible OPV devices ; To push the flexible OPV devices for large-area applications.

- Supervisor:

Prof. Zhou Yinhua, Ph.D. Supervisor of Wuhan National Laboratory for Optoelectronics, candidate of the overseas high-level talent program (youth), RSC Fellow.

- **Project 7: Multi-dimensional ultralong-life-time glass data storage**
- Project length: one semester to one acdemic year
- Project Content: 5 to 10 months

The main research contents of Researcher Zhang Jingyu's team are as follows: Ultrafast laser induced nanostructures in glass materials have proven to maintain data stability up to billions of years. In this project, the team mainly focuses on the combination of multi-dimensional data storage techniques and superresolution techniques. By harnessing the valence state and electronic state properties of the materials, a super-resolutional multiplexed data spot could be fabricated in high Young's modulus transparent materials.

- Supervisor:

Researcher Zhang Jingyu, Ph.D. Supervisor of Wuhan National Laboratory for Optoelectronics, his research result (ultra-high density storage technology) was selected as one of the "top ten scientific and technological advances in the world in 2016", and also listed as "the longest storage technology in the world" by Guinness.

HUST Scientific Research Internship Program

Wuhan National Laboratory for Optoelectronics

- **Project 8:** **Preparation of perovskite single crystal by solution method and its application in X-ray detection**

- **Project length: 6 to 12 months**
- **Project Content:**

The main research contents of Prof. Xu Ling's team are as follows:Although perovskite materials have high electron and hole mobility and large atomic number, their application in the field of high-energy ray detection is still limited by their excessive dark current. In order to solve the problem of dark current of perovskite materials, further research is needed from the following directions: High quality single crystal growth process; Control perovskite material X-ray detection performance parameters; Reduce the dark current of the detector; Improve the resolution of the detector by adjusting the electrode structure.

- **Supervisor:**

Prof. Xu Ling, from Wuhan National Laboratory for Optoelectronics, published dozens of academic papers as the first author or corresponding author in high-level journals such as Advanced Energy Materials, Advanced Functional Materials, Advanced Electronic Materials, Journal of Physical Chemistry A, Journal of Physical Chemistry C, Applied Surface Science, and applied for two national invention patents.

- **Project 9:** **Modeling of Alzheimer's Disease**

- **Project length: 1 to 6 months**
- **Project Content:**

The main research contents of Associate Prof. Chen Shangbing's team are as follows: Probing the Ca2+ dynamics and synaptic transmission in astrocyte-neuron network during Alzheimer's Disease with multi-level modeling

- **Supervisor:**

Associate Prof. Chen Shangbing, from Wuhan National Laboratory for Optoelectronics, conducted cooperative research at Bradford University in the UK from February to May 2008 and postdoctoral research at the Medical College of University of British Columbia in Canada from August 2010 to August 2012.

- **Project 10:** **Quantitative determination of abnormal cerebrospinal fluid (CSF) circulation in autism by using advanced optical imaging techniques**

- **Project length: 6 months**
- **Project Content:**

The main research contents of Senior Engineer Liu Ping's team are as follows:Circulation of the cerebrospinal fluid (CSF) in the central nervous system (CNS) has been demonstrated to play an important role in neuron functions and metabolism, and insufficient circulation could result in reduced clearance of interstitial fluid (ISF) and is thought to be related to behavior disorders in autism. Therefore, to study the CSF circulation in a mouse model of autism may help us to look insight into its mechanism and find potential treatments. We will apply in vivo two-photon microscopy, light sheet microscopy, large-field stereo microscopy and laser-scanning confocal microscopy et., to quantitatively determine the water channel aquaporin-4 (AQP4) expression and distribution in the brain lymphatic pathways in both control mouse model and autism mouse model. We will further investigate adjustments of AQP4 expression/distribution by focused ultrasound treatment and its potential to improve the influx and efflux of the bulk fluid flow in the CNS in autism mouse model.

- **Supervisor:**

Senior Engineer Liu Ping, from Wuhan National Laboratory for Optoelectronics, was a researcher in the Department of Chemistry of the National University of Singapore and an associate researcher in the Department of Cell Biology and Physiology of North Carolina State University Chapel Hill Branch.

HUST Scientific Research Internship Program

Materials Science and Engineering
Intellectual Property Law & Management

School of Materials Science and Engineering

- **Project 1:** Wafer-scale fabrication of two-dimensional semiconductor materials for arrayed optoelectronic image sensors
- Project length: 12 months
- Project Content:

This project aims to address the challenges in the wafer-scale fabrication of two-dimensional (2D) semiconductor materials and the bottlenecks in the development of optoelectronic integrated devices. The proposed induced-growth strategy intends to control the chemical vapor deposition nucleation and growth processes of various 2D semiconductors. Combining theoretical calculations and in-situ transmission electron microscopy, the project seeks to understand the nucleation and growth processes of 2D semiconductors, revealing their growth mechanisms. By depositing inorganic molecular crystals between the two-dimensional semiconductor and metal electrodes to form van der Waals tunneling junctions, the project aims to achieve high-quality contacts between materials and electrodes. Based on the above research, the project will construct wafer-level optoelectronic integrated devices to enable high-performance imaging applications of 2D semiconductors. The outcomes are expected to promote the development of new optoelectronic materials and micro-nano integrated devices, thereby meeting the significant demands in the optoelectronic industry.

- Supervisor:

Prof. Dr. Yuan Li is currently a professor in the School of Materials Science and Engineering in Huazhong University of Science and Technology. His research interest is mainly focused on 2D optoelectronic materials and devices. Prof. Li has published more than 80 peer-reviewed papers in Chemical Reviews, Advanced Materials, Advanced Energy Materials, Advanced Functional Materials, ACS Nano, Nano Letters, Materials Horizons and so on. He was elected for National High-level Young Talent Program of China and Chutian Young Scholar in Hubei province.

- **Project 2:** High performance electrocatalysts for water splitting
- Project length: 6 to 12 months
- Project Content:

Water electrolyzers with proton exchange membrane have drawn special attention due to the national demands for the development of clean and sustainable energy conversion technologies. One of the greatest challenges for acidic water splitting is the design of advanced oxygen evolution electrocatalysts. The sluggish kinetics of oxygen evolution requires efficient catalysts to reduce the overpotential. Moreover, the stability of the catalysts should be carefully reconsidered due to the harsh condition during acidic oxygen evolution. Precious metal materials such as Ir and Ru-based compounds are well-known electrocatalysts for acidic oxygen evolution with high activity and moderate stability, but they suffer from high cost and low abundance. Therefore, efforts should be devoted to developing precious-metal-less/free acidic oxygen evolution electrocatalysts with high activity and stability. This project would design advanced OER electrocatalysts through tuning the electronic states of the active sites and enhancing the corrosion resistance of the substrate. So as to achieve efficient hydrogen production form water splitting.

- Supervisor:

Prof. Dr. Tanyuan Wang is currently an associate professor of School of Materials Science and Engineering in Huazhong University of Science and Technology. He received his Ph.D. in Chemistry from Peking University in 2015 and worked as a visiting scholar at Stanford University from 2017 to 2018. His current research interests include functional nanomaterials and their applications in electrocatalysis (such as water splitting and CO2 reduction). He has published more than 50 peer-reviewed papers in Nat. Commun., Adv. Mater., Energy Environ. Sci., Angew. Chem. Int. Ed., J. Am. Chem. Soc., Adv. Energy Mater., ACS Catal. and so on. He was elected for Chutian Young Scholar in Hubei province.

Sino-European Institute for Intellectual Property

- **Project 1:** Promoting Ethical and Sustainable Innovation in the Era of Generative AI - Comparative Analysis on Laws, Regulations and Cases in China and EU

- Project length: 14 days to 1 year
- Project Content:

Based on comparative research on recent AI regulation and Law between China and EU, especially <The Interim Administrative Measures on Generative AI Services> in China and the <EU Artificial Intelligence Act>, also based on recent AI case studies related to intellectual property, and ethics issues (including fairness and safety). This research will put forward some suggestions about restrictions and supplemental regulations etc. in the related laws (including patent law, copyright law). And gives considerations for promoting the sustainable development of AI industry by promoting ethical and sustainable innovation.

- Supervisor:

Professor and Director of the Sino-European Institute for Intellectual Property of HUST. Vice President for International Cooperation of Hubei Normal University. Member of Academia Europaea.

Dr. Yu, Xiang is a professor at the School of Management (2002-; http://english.cm.hust.edu.cn/) and the Director of the Sino-European Institute for Intellectual Property (http://patent.hust.edu.cn/) of Huazhong University of Science & Technology (HUST, http://www.hust.edu.cn/) in Wuhan, China. Since March 2017, Prof. Yu also holds the post of the Vice President for International Cooperation of Hubei Normal University.

He is the Director of the Chinese IP Team for the US-China CERC Project (http://www.us-china-cerc.org/, 2011-), and the Director of the Chinese IP Team for the China-EU/EEA NZEC-CCS Project (2013-). As a guest professor or speaker, he gives lectures and presentations regularly in Germany, France, Switzerland and many other countries.

Prof. Yu was granted to be a German Alexander-von-Humboldt Research fellow in 2004 and was granted to be a JSPS (Japan Society for the Promotion of Science) research fellow in 2006-2007. He is a Member of Academia Europaea (https://www.ae-info.org/, 2020-), Member of the IP Experts Group of China (2005-).

HUST Scientific Research Internship Program

Artificial Intelligence, Civil Engineering and Architecture

School of Artificial Intelligence and Automation

- **Project 1:** **Measurement and control technology**
- **Project length: 4 weeks to 12 months**
- **Project Content:**

The main research contents of Prof. Liu Wenzhong's team are as follows: Microscale Imaging and Microscale Thermometry: Nanoscale Thermal Imaging, Application Research in AI in Satellite Image Recognition. Carbon Meter (greenhouse gas emission) and low Carbon Technology: Accurate Metrology for Greenhouse Gas Emission--Carbon Meter. Frontier Medical Imaging: Cardiac Fast MRI at High Field, High Resolution Ultrasound Tomography, Ultra-high Temporal Resolution PET Imaging Technology. Brain-inspired Computing and Brain-Computer Intelligence: Brian-computer Interface and Rehabilitation Robot. Intelligent Energy Control and Optimizationl.

- **Project 2:** **Development of polymer-based carriersmodified with iron oxide nanoparticles for high-resolution imaging and therapy of metastatic lung cancer**
- **Project length: 6 months**
- **Project Content:**

The main research contents of Prof. Liu Wenzhong's team are as follows: Development of polymer-based carriersmodified with iron oxide nanoparticles for high-resolution imaging and therapy of metastatic lung cancer

- **Supervisor:**

Prof. Liu Wenzhong, Director of the Belt and Road Joint Laboratory on Measurement and Control Technology, Director of the Department of Measurement Science and Instruments, Director of the Chinese Society of Instrumentation, member of the Instrument Science and Technology.

School of Architecture and Urban Planning

- **Project 1:** **Habitat Patterns Optimization of Country Parks Based on Characteristics of Ecosystem Services Gradient Tradeoff: a Case Study of Wuhan**
- **Project length: 3 to 12 months**
- **Project Content:**

The main research contents of Associate Prof. Han Yiwen's team are as follows: three parts: 1. constructing the habitat database of country parks; 2. modeling and quantifying characteristic of "ecosystem service gradient trade-off (ESGT) " ; 3. habitat pattern optimization and regulation in Country Parks Based on Characteristics of Ecosystem Services Gradient Tradeoff.

- **Supervisor:**

Associate Prof. Han Yiwen, from the School of Architecture and Urban Planning, has worked in the Institute of Architectural Design and Research of Tsinghua University, participated in nearly 20 design and engineering projects, and published more than 20 papers.

- **Project 2:** **The value determination and protection path of rural heritage for rural settlements in the Tujia region of southwest Hubei**
- **Project length: 6 months**
- **Project Content:**

The main research contents of Associate Prof. Wang Tong's team are as follows: studying the mechanism of rural spatial form under the spatial distribution law of "mountain - house - field - water", and deeply dig the genealogy of rural heritage from the perspective of cultural landscape. The value determination and protection path of rural heritage resources are studied by using interdisciplinary and multi-dimensional evaluation techniques.

- **Supervisor:**

Associate Prof. Wang Tong, deputy director of the Landscape Department of the School of Architecture and Urban Planning, and executive director of the Design X Innovation and Entrepreneurship Practice Center.

School of Civil and Hydraulic Engineering

- **Project 1:** **Carbon Footprint Reduction and Rejuvenation Process of Reclaimed Asphalt Pavement for Sustainable Road Construction**
- **Project length: 4 weeks to 10 months**
- **Project Content:**

The main research contents of Associate Prof. You Lingyun's team are as follows: Our research can be divided into the following three tasks: TASK-1: Evolutions of the 3D microstructure of asphalt-aggregate in RAP. TASK-2: Neural network interatomic potentials to facilitate the chemical reaction in RAP. TASK-3: Carbon footprint assessments of road infrastructure construction with different RAP content.

- **Supervisor:** Associate Prof. You Lingyun, co-chair (Co-PI) or backbone of the National Natural Science Foundation (NSF), National Natural Science Foundation (NSFC), Michigan Department of Environment (EGLE) and other scientific research projects.

HUST Scientific Research Internship Program

Naval Architecture and Environmental Science

School of Naval Architecture and Ocean Engineering

- **Project 1:** Reversible energy absorption performance of a novel fluid nanofoam system (LNF) subjected to impact loading
- Project duration: 3 to 12 months
- Project Content:

The main research contents of Associate Prof. Huang Wei's team are as follows: Experimental study on the impulsive transmitting and energy absorption of LNF. The dynamic mechanical performance of LNF is experimentally tested on SHPB. According to the incident and transmitted pulses, the impulsive transmitting and energy absorption mechanisms of LNF should be revealed. Reversibe energy absorption of LNF under the single pulse loading
Using the single pulse SHPB, LNF subjected to varying strain rates is carried out. Based on the experimental data, the reversible energy absorption characteristics of LNF should be analyzed.

- Supervisor:

Associate Prof. Huang Wei, presided over several NSFC projects and National Key Laboratory Fund projects.

- **Project 2:** Mooring design and response analysis of floating wind turbine foundation under typical sea states
- Project duration: 3 to 12 months
- Project Content:

The main research contents of Associate Prof. Xiang Gong's team are as follows: The mooring design and dynamics of floating wind turbine foundation and its mooring system under typical wave conditions (operating sea conditions and extreme sea conditions) are taken as the core research objective. For the combination design of floating wind turbine foundation and different mooring systems, the nonlinear coupled dynamic characteristics such as the motion and structural responses under typical wave conditions are developed. The main research contents include: 1. Frequency domain analysis of the wave loads and motion responses of offshore wind turbine foundation; 2. Time domain coupled dynamic analysis of offshore wind turbine foundation and mooring system.

- Supervisor:

Associate Prof. Xiang Gong , selected into "Young Elite Scientist" program by China Association for Science and Technology, member of IAOE , MEVE and other international conference technical committees , chairman of QR2MSE branch , member of IAOE , member of SNAME , and young editorial board member of " China Ship Research ".

- **Project 3:** Maintenance planning and optimization for offshore wind turbine
- Project duration: 3 to 12 months
- Project Content:

The main research contents of Associate Prof. Liu Yan's team are as follows: Offshore wind turbine (OWT) has an important role for the lower carbon future. The key technical challenges associated with OWT operation and maintenance needs to be addressed for the safe and sustainable development. Based on the main deterioration and failure mode of OWT, the research aims to develop data-driven and physics-based methods for intelligent maintenance planning. The main research contents include: 1. Condition based maintenance policy of offshore wind turbine component and system; 2. Reinforcement learning based inspection and maintenance planning of offshore wind turbine.

- Supervisor:

Associate Prof. Liu Yan, "Outstanding Scholar in Central China", selected into the high-level overseas talent plan of Hubei Province, winner of the Raymond Reese Research Prize of the American Society of Civil Engineers (ASCE).

School of Environmental Science & Engineering

- **Project 1:** Environmental Remediation by photocatalytic and carbon techniques
- Project length: 12 months
- Project Content:

The main research contents of Prof. Zhang Yanrong's team are as follows: Photocatalytic technique for wastewater treatment; Biochar technique for wastewater treatment.

- Supervisor:

Prof. Zhang Yanrong, presided over more than 20 scientific research projects, including the Ministry of Science and Technology's special project for international scientific and technological cooperation and exchange, the general project of NSFC, and other provincial and national large-scale enterprise scientific research projects.

- **Project 3:** Nanotechnology to Enhance Water Security
- Project length: 12 months
- Project Content:

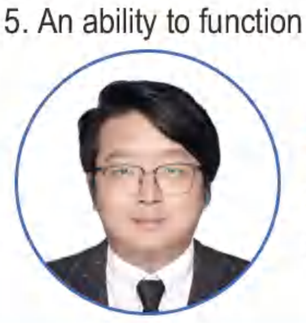
The main research contents of Prof. Zhou Tao's team are as follows: Developing catalytic nanomaterials based on the earth abundant transition metal elements (e.g., Fe, Mn, etc.) for efficient Fenton reaction. Developing miniaturized equipment for distributed wastewater treatment.

- Supervisor:

Prof. Zhou Tao, Ph.D. supervisor, undertaking the national key research and development programs and the National Natural Science Foundation projects, served as the communication reviewer of the National Natural Science Foundation.

- **Project 2:** Applied Spatial Science for Ecohealth
- Project length: 3 to 12 months
- Project Content:

The main research contents of Associate Prof. Li Sen's team are as follows:
Overview:
Our research provides opportunities to learn a variety of analytic and visualisation methods in remote sensing and geographical information science and apply them to solve problems and support decision-making in Ecoheath. Motivated interns are sought to participate in analysing environmental and social survey data, build spatial statistical models and map the projected outcome.
Case study:
The aims of the case study are to understand the individual and environmental factors influencing people's exposure to tick bites, and to assess the potential exposure risk pattern in endemic region of tick-borne diseases in northeast China.
Methods:
This project applies the spatial analysis (geo-statistics), AI-based species distribution modelling, GIS and remote sensing.
Learning outcomes:
By the end of this project interns should have gained:
1. An ability to apply knowledge of GIS and applied remote sensing.
2. An ability to apply advanced spatial analytic methods for health issues.
3. An ability to use open-source remote sensing data for geographical analysis.
4. An ability to design and conduct social survey, as well as to analyze and interpret data.
5. An ability to function on multi-disciplinary teams.



- Supervisor:

Associate Prof. Li Sen, honorary researcher at the Environmental Change Institute of the University of Oxford, UK.

HUST Scientific Research Internship Program

Hospital,Medicine and Health Management

Union Medical College Hospital

- **Project 1: Research on the mechanism of Phyllanthus urinaria L. extract controlling cytomegalovirus infection in recipients after transplantation by activating the cGAS-STING pathway**
- **Project length: 12 months**
- **Project Content:**

The main research contents of Prof. Zhao Lei's team are as follows: Post-transplantation infection is one of the key factors affecting the success of organ transplantation. Cytomegalovirus (CMV) is the most common pathogen in transplant recipient infections. At present, anti-CMV therapy in western medicine is limited in terms of effectiveness and safety. Recent studies have found that inhibition of the cGAS-STING pathway is an important mechanism for CMV to evade immune clearance. According to traditional medicine, CMV infection belongs to the excessive of heat-toxicity, and Phyllanthus urinaria L. is the essential medicine for clearing heat and removing toxicity in national medicine. Our previous research found that Phyllanthus urinaria L. and its active constituents have significant antiviral effects. Our pre-experiment found that the extract of Phyllanthus urinaria L. have significant regulating effect on the molecules related to cGAS-STING pathway. Based on this, we hypothesized that Phyllanthus urinaria L. extract can control CMV infection by activating the cGAS-STING pathway. Our research is focused on: conducting research from several levels such as cell lines, animal and human primary cells, animals and humans, and use RNAi, lentiviral vectors, CRISPR-Cas9 and other technologies to down-regulate or up-regulate target genes, and to clarify the target of cGAS-STING pathway that Phyllanthus urinaria L. extract regulates to inhibits CMV replication, to provide a new strategy for the control of CMV infection after transplantation.

- **Supervisor:**

Prof. Zhao Lei, Ph.D. supervisor, chief physician of the Department of Infectious Diseases of the Union Hospital, "Outstanding Scholar in Central China", presided over three NSFC projects.

- **Project 2: Study on the anti-tumor mechanism of aloperine**
- **Project length: 6 to 12 months**
- **Project Content:**

The main research contents of Prof. Hu Desheng's team are as follows: Aloperine is a kind of monomer component of traditional Chinese medicine extracted from Sophora alopecuroides. Our previous experiments showed that Aloperine can effectively kill tumor cells in vitro, but its specific mechanism is still unclear. Our research is focused on: carrying out work from the following aspects: 1. To further verify the anti-tumor effect in vitro; 2. To verify its anti-tumor effect in in vivo experiment by using mouse subcutaneous and xenograft tumor models; 3. To investigate the underlying anti-tumor mechanism of aloperine and pave the road for patent application.

- **Supervisor:**

Prof. Hu Desheng, Ph.D. supervisor from the Union Hospital, deputy director of the Department of western and traditional Chinese medicine.

School of Medicine and Health Management

- **Project 1: Digital empowered primary healthcare governance mode identification and policy implications**
- **Project length: 6 to 12 months**
- **Project Content:**

The main research contents of Associate Researcher Zhang Wei's team are as follows: In China, healthcare organizations have embraced digital technologies to facilitate access to services, increase the efficiency and service quality, and enhance patient experience. Featuring on primary healthcare organizations exclusively, this project aims to 1) build a case library of digital transformation in primary healthcare with extensive field studies across Wuhan, 2) explore the evolution, antecedents, and outcomes of digital transformation in primary healthcare, 3) identify digital empowered primary healthcare governance models and provide optimal strategies for success digital transformation in primary healthcare.

- **Supervisor:**

Associate Researcher Zhang Wei, Deputy Secretary-general, Professional Committee of Maternal, Child and Public Health under Chinese Maternal and Child Health Association. He is from the School of Medicine and Health Management, was funded by CSC to go to the Department of Political Science of Columbia University in the United States for joint training in 2013-2014(the cooperative tutor was Professor Robert Shapiro).

HUST Scientific Research Internship Program

Public Administration, Economics and Journalism

College of Public Administration

- **Project 1:** **Research on Behavioral Public Administration**
- **Project length: 3 to 12 months**
- **Project Content:**

The main research contents of Prof. Chen Zhixia's team are as follows: exploring the related issues such as leadership behavior, organization behavior and human resource management, citizen coproduction and administration from the perspective of BPA. At present, the relevant representative researches in our lab mainly include: the Matthew effect leadership behavior, leadership ostracism, female leader and career development, urban happiness index, work initiative, public service motivation, co-production, job performance, job stress, etc. There are many other research issues that can be discussed from the perspective of BPA in the field of public administration. Most topics of public administration can be researched from the perspective, theory and method of BPA, such as e-government, network governance, street level bureaucracy, the relationship between elected officials and public administrators, and accountability.

- **Supervisor:**

Prof. Chen Zhixia, Ph.D. supervisor, from the School of Public Administration, director of the Research Center for Psychology and Human Resources.

- **Project 2:** **Study on the spreading of terrorism information via social media and governance**
- **Project length: 3 to 12 months**
- **Project Content:**

The main research contents of Prof. She Shuo's team are as follows: At present, global terrorist are keen to use social media to create social panic, spread brainwashing information and recruit members. Under the superposition of the COVID-19, as the popularization of social media will further catalyze the threat of international terrorism to national security. Therefore, it is an urgent task to study the social media transmission path of terrorism information and formulate countermeasures to build a national security system with Chinese characteristics and achieve national sustainable development. Our research is focused on:

New characteristics of terrorism information dissemination via social media; Content of terrorism information and its social media communication behavior, channel selection and communication strategy; Evolution of social media communication path of terrorism information and related influencing factors;The government's response to the spread of terrorism information via social media.

- **Supervisor:**

Prof. She(Seah) Shuo, Deputy Secretary-General of Hubei Public Management Research Association, Researcher of ASEAN Research Center of Huazhong University of Science and Technology, and Researcher of Modern Leadership Science and Art Research Center of Huazhong University of Science and Technology.

School of Economics

- **Project 1:** **The measurement and effects of firm's technical transformation and spillover**
- **Project length: 2 months**
- **Project Content:**

The main research contents of Prof. Ouyang Hongbing's team are as follows: With global and Chinese digital economy development, innovation-driven national policy as a medium- and long-term strategy, and digital technology as a general-purpose enabling technology, this project constructs a theoretical analysis framework for digital technology transformation and capital market economic consequences in the backdrop of digital economy. Our research is focused on: 1. A quantitative measurement method for the degree of digital technology transformation of enterprises, and construct an index of digital technology transformation of enterprises;

2. Combine the digital technology transformation of enterprises with the total factor productivity of enterprises to test the economic performance of digital transformation at the level of technological innovation;

3. Research on the conceptual model, theoretical hypothesis, hypothesis testing, mechanism and heterogeneity of enterprise digital technology transformation and stock rate return and stock price synchronization.

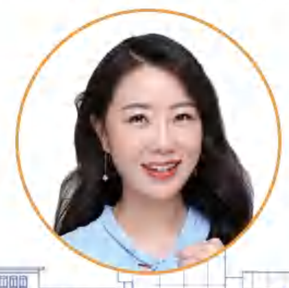
- **Supervisor:**

Prof. Ouyang Hongbing, from the School of Economics, has participated in the National Natural Science Foundation, the National Social Science Foundation and the National 985 Program, and has presided over and studied the scientific research projects of the Korean Foundation and the City University of Hong Kong.

School of Journalism and Information Communication

- **Project 1:** **Precision Communication Research: Theory, Approach and Evaluation**
- **Project length: 3 to 12 months**
- **Project Content:**

The main research contents of Prof. Xu Minghua's team are as follows: Precision communication refers to the precise positioning of communication subjects and their needs by the media at the right time and right space, relying on modern information technology means, using the best communication channels, and providing the audience with the required news information and its one-to-one personalized services. Precise international communication is of great significance to enhance the affinity and effectiveness of international communication. Precise international communication refers to the dynamic matching of "international users - cross-cultural information", including accurate subjects, accurate content, accurate distribution, and accurate feedback. Due to the challenges of multi-platform differences, multi-language differences, and multi-group differences, there are many urgent problems to be solved in precision international communication, including theoretical construction, method research and effect evaluation of accurate international communication. For example, how to coordinate and accurately communicate global expression, regionalized expression, focus expression, etc., as well as there is still room for improvement in disseminating common stories, deepening fan research, and seeking group empathy. This program will provide interns with guidance on related research topics, combined with international communication theory and machine learning technology, and carry out corresponding special research.



- **Supervisor:**

Prof. Xu Minghua, Ph.D. supervisor, chief expert of major projects of the National Social Science Foundation, head of Chinese Communication Association (CCA) in Central China, and selected as "Outstanding Scholar of Huazhong University of Science and Technology".

LIFE AT HUST

Convenient Living Facilities

HUST has:

- 30+ student canteens
- 10+ student supermarkets
- 2 campus hospitals
- 5 campus shuttle buses

Accommodation

Room Type	Pay by Month
Single Room	1,200 CNY/month
Double Room	700 CNY/month
Facility	Washing room, water heater, air conditioner, Internet, furniture and etc.

Various Student Activities

100+ Various Student Clubs

Students' International Communication Association (SICA), under the guidance of School of International Education, offers worth-while, instructive and unique extra-curricular activities such as Chinese Corner, Tutor Programs for International Students (TPIS), Go Visiting Primary and Secondary Schools, Explore World in HUST, New Year Gala, etc.

Wuhan is the biggest city in the middle of China and you can sum it up by looking at the spelling of its name

“W” is for water.

Wuhan is nicknamed “the city of rivers”, because the Yangtze and the Han rivers meet here. The city is also noted for its lakes. Water makes up one quarter of its territory.

“U” is for university.

With a university student population of 1.3 million , Wuhan is the largest college town in the world.

“H” is for high technology.

Optical fibre , biotech , lasers , smartphones , they are all developed in Wuhan.The city is a high-tech hub and home to legions of top firms, such as Pfizer , Microsoft , Huawei, Xiaomi and HGTECH.

“A” is for automobile.

Wuhan is one of China's “motor cities”. 1 out of every 10 of the vehicles on the road in China is made here. General Motors, Honda, PSA Group and Dongfeng all have big manufacturing plants in Wuhan.

“N” is for noodle.

The hot dry noodles soaked in sesame paste known by the locals as Reganmian, are as much a trademark of Wuhan as spaghetti is in Rome or hamburgers in the US. During the coronavirus outbreak , the noodles became a symbol of solidarity. People all over China were cheering on the hot dry noodles.

“H” is for hero.

Wuhan went through a tough time with the epidemic. Now, with precious help from health worker heroes from all over the country and a concerted effort from its citizens, the city has regained its vitality and is steaming ahead.

HUST LOCATION

Wuhan, capital of Hubei province, is the largest city in central China and one of the top 10 megacity nationwide. It has long been the educational, economic, industrial and transportation hub in China, covering a total area of 8569.15 square kilometers and above 11 million population.

• China's Higher Education and Innovation Center

84 universities & colleges
1 million college students
Over 700 research institutes
Known as “China Optical Valley” with world largest optical industry

• China's Transportation Hub

59 international flights to foreign cities like Paris, San Francisco, Moscow, Bangkok and other cities around the world
Heart of China high-speed railway network: convenient to reach other centered cities like Beijing, Shanghai, Guangzhou and so on.
Yangtze river, world's third longest river, flows through Wuhan.

• China's Economic and Industrial Center

Over 100 world top 500 companies set up branches here
One of the three largest iron and steel bases
One of the three automobile manufacture bases
One of the shipbuilding bases

• China's Central Hub of Internationalization

Over 50,000 foreign residents
Changjiang Weekly English Newspaper offered since 2013
5 consulates at present
More than 10,000 international students from more than 160 countries

Contact Us

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