



上海交通大学
SHANGHAI JIAO TONG UNIVERSITY

SJTU SUMMER RESEARCH INTERNSHIP PROGRAM



2018



Contact :
<http://summerprogram.sjtu.edu.cn/>
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S J T U
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SUMMER RESEARCH
INTERNSHIP
PROGRAM
18

Shanghai Jiao Tong University (SJTU) is a higher education institute in China, which enjoys a long history and a world-renowned reputation. Through 121 years of unrelenting effort, SJTU has become a comprehensive and research-oriented top international university in China. SJTU enjoys an ever-increasing level of scientific research excellence and technological innovation. During 2015, SJTU was named the leading institute in the nation, in terms of project numbers and amount of money issued by the National Natural Science Foundation of China, for the 6th consecutive year. SJTU also ranks second in the nation for sponsored research grants.

SJTU Summer Research Internship Program aims to promote international research collaboration and enhance the academic environment at Shanghai Jiao Tong University. It offers excellent undergraduate students from around the world the opportunity to spend a summer studying at world-class research laboratories, alongside prominent research professors. It will prepare undergraduate students for further study through intensive research experience with faculty mentors and enrichment activities.

In addition, participants will develop their research skills by enjoying lectures with topics such as "How to Write a Research Essay", "How to Cooperate in a Project" etc. Participants will also learn about Chinese language and culture which will enhance their intercultural awareness and communication.



What Participants will receive?

- > Knowledge of the top research projects in China
- > The opportunity to work with top Chinese professors, fellows, and students
- > A good basis for a career in academic research
- > The opportunity to co-author a scientific paper
- > Knowledge of Chinese language and culture
- > A rewarding and unforgettable experience in China

Eligibility Requirements

- > Students from overseas, Hong Kong, Taiwan, Macao are eligible to apply
- > Students must have completed at least one year of an undergraduate program and be enrolled as a current undergraduate
- > Hold at least a 3.0 GPA on a 4.0 scale or equivalent
- > Students from non-English speaking countries must provide an English language proficiency certificate: an IELTS score no less than 6.0 or a TOEFL score no less than 78 points. If you are studying a fully English taught program, please provide the relevant certificates.
- > Additional requirements vary per laboratory

Duration

11 July, 2018-17 August, 2018

Academic Information

Credit	3 SJTU Credits
Program duration	In-Lab Hours: 20 hours/week Chinese Language and culture course: 3 hours/week ¹
Assessment	There are three grading sections in this program: Attendance = 30% Midterm presentation = 30% Final written report = 40%

Application Procedures



Please apply through the website : <http://apply.sjtu.edu.cn> ²

The following items shall be uploaded alongside the online application:

- > A scan of the identification page of your passport. The passport must be valid for at least 6 more months for the visa application.
- > ID photo (similar to a passport photo)
- > Curriculum vitae (CV)
- > Copy of your most recent academic transcript
- > Motivation letter
- > Recommendation letter
- > Report of your past research experience (if available)
- > Language proficiency certificate (if available)

Program Fee ³

Application fee (Non-refundable)	400RMB
Tuition fee	8000RMB

* Tuition fee waived for all participants

¹ The course is available from 11, July to 3, August and is optional.

² It is very important that you fill in your name correctly on the online application. You should type in your legal name as it appears on your passport exactly.

³ The estimated cost including the meal plans is about 500 RMB/week.



Scholarship Opportunities

Outstanding candidates may receive an additional scholarship of 3000 RMB

Criteria for Scholarship

- > GPA: 3.4/4.0
- > Must have previous research experience
- > Candidates who have won awards for research or independently accomplished a research project are preferred.

Online Application Deadline

30 April, 2018

Announcement

You will be notified of the results through our website and an email within two weeks of completing the application.

Certificate and Transcript

After completing the program and submitting the final report, participants will receive an official certificate from the university.

Official transcripts will be sent to the mailing address you provided in the application in September, 2018. Students who wish to transfer credits need to obtain pre-approval from the relevant authorities at their home universities.

🔍 Accommodation

SJTU Summer Research Internship Program will be conducted at two campuses: Xuhui and Minhang. Students are able to choose on-campus accommodation dependent on the location of the lab.

Room reservations should be made online at dorm.sjtu.edu.cn and the accommodation fee should be paid online. More detailed information regarding the reservation of accommodation will be released once you have been admitted to the SJTU Summer Research Internship Program.

For more information, please contact International Student Service Center
Minhang Campus: issc_minhang@sjtu.edu.cn +86-21-34203955
Xuhui Campus: issc_xuhui@sjtu.edu.cn +86-21-62933305

🔍 Visa

SJTU will provide students with a JW 202 and an admission notice. Applicants should bring the visa paperwork, admission notice, JW 202 form and a valid passport to the local Chinese embassy or consulate to apply for a short-term student visa (usually the visa type "X 2"). Those who are already in China need to submit a copy of the visa page, residence registration notice and the above application documents to the PCB in Shanghai after registering at SJTU.

The JW 202 form and the admission notice will be sent to the applicant via an international courier within two weeks after April 30, 2018.

* If you are a local student from Hong Kong, Macao or Taiwan, you do not need the JW202 form.

🔍 Insurance

Students who plan to attend this program should obtain an insurance before coming to study in China. Each student needs to present the insurance certificate to the administrative staff on the registration day.

🔍 Timeline

Preparation for the application	September to December, 2017
Completion of the online application	January to April, 2018
Notification of the application result	February to May, 2018
Scholarship announcement	May, 2018
Visa application and insurance	May to June, 2018
Online accommodation reservation	June, 2018
Registration & Dormitory check-in	11 July, 2018
Welcome reception	12 July, 2018
Internship	11 July-17 August, 2018
Dormitory check-out	18 August, 2018
Transcript delivery	September, 2018

🔍 Contact

Email: isc.mobility@sjtu.edu.cn
Website: <http://summerprogram.sjtu.edu.cn/>



LIST OF RESEARCH PROJECTS

Mechanical Engineering

- Project 1 Hand-Eye Coordination Algorithm for Minimally Invasive Surgical Robot
- Project 2 Optimal Design of Neural Electrode Coating
- Project 3 Key Technology in Endoscopic Surgical Robotics Based on Augmented Reality
- Project 4 The Research on Digital Manufacturing of Customized Surgical Templates in Oral and Maxillofacial Surgery Based on Virtual Reality and 3D-Printing
- Project 5 Surgical Robot End-Effector Mechanism Design
- Project 6 Highly Efficient Dehumidification Cooling Technology
- Project 7 Fault Diagnosis for Wind Turbines Based on the Sound Visualization
- Project 8 Guided Wave-Based Structural Health Monitoring
- Project 9 Smart Material Actuation
- Project 10 Vibration Energy Harvesting
- Project 11 Hand Gesture Recognition through Soft Wearable Devices
- Project 12 EMG Decoding and Prosthetic Hand Control Based on Motor Unit Action Potential
- Project 13 Soft Robots

Electronic Information and Electrical Engineering

- Project 14 Optical Fiber Communication
- Project 15 Design of High Performance Antennas Using Novel Microwave Structures and Materials
- Project 16 Neural Patterns Among Different Cultures for EEG-based Emotion Recognition

Naval Architecture, Ocean & Civil Engineering

- Project 17 Model Tests on Marine Renewable Energy Devices
- Project 18 Multidisciplinary Aero-hydro-servo-elastic Analysis of Offshore Floating Wind Turbines
- Project 19 Vortex Induced Vibration of a Catenary Riser

Environmental Science & Engineering

- Project 20 Near-Infrared Spectroscopy for Discrimination Between Polymethyl Methacrylate and Methyl Methacrylate
- Project 21 Fabrication of Superhydrophobic Nanofiber Membrane and its Application for Removal of Nonvolatile Contaminant in Water

Life Sciences and Biotechnology

- Project 22 Cloning and Functional Characterization of Rice Male Sterile Genes
- Project 23 Molecular Mechanism Controlling Inflorescence and Spikelet Development in Rice and Barley
- Project 24 Molecular Characterization of GMOs.
- Project 25 The Study of the Paternal Transgenerational Effects of Tobacco Smoking/nicotine Via the Underlying Epigenetic Mechanisms.
- Project 26 Epigenetic Effects and Molecular Mechanisms of Pebp1 Gene in Spermatogenesis
- Project 27 Comparing Thousands of Big Genomes
- Project 28 Computer Aided Drug Design
- Project 29 Protein-Protein Interaction

Agriculture and Biology

- Project 30 Metabolic Regulation and Engineering of Medicinal Plants
- Project 31 Ecological Stoichiometry of Fagaceae Trees and Parasite Weevil larvae at Soil Phosphorus-Rich Sites in Subtropical China
- Project 32 Vegetation and Aerosol Fine Particles (PM2.5)
- Project 33 Viticulture and Enology
- Project 34 Ecological Restoration and Eco-design of Urban-Rural Fringe in Shanghai

Biomedical Engineering

- Project 35 Transcranial Ultrasound Stimulation and Applications
- Project 36 Ribosome Specific Protein-Protein Interaction Network Construction for Mycobacterium Tuberculosis
- Project 37 Mechanisms of New Targets in Tumor Metastasis and Development of Therapeutic Methods

Pharmacy

- Project 38 Pain and Treatment
- Project 39 Development and Utilization of Traditional Chinese Herbal Medicine

Project 17

Model Tests on Marine Renewable Energy Devices

Contact Information

Prof. Ye Li
Email: ye.li@sjtu.edu.cn

Project Description and Objectives

Renewable energy has occupied the forefront of energy supply studies around the world. With the advancement of science and technology, the use of renewable energy has expanded towards the ocean in the last decade. Particularly, tidal current and wave energy are regarded as the two kinds of marine renewable energy with the greatest prospects. In this project, models of tidal current turbines and/or wave power generators will be tested in a ship model towing tank, to measure their hydrodynamic performance, which is the key to marine renewable energy extraction.

Eligibility Requirements

- > Interested students should have basic knowledge of ocean engineering, mechanical engineering, energy engineering or similar fields.
- > Proficiency in speaking and writing is essential.

Main Tasks

Preparation of the facilities and instruments; Model test of the tidal current turbines and/or wave power generators; Data acquisition and analysis.

Website

Lab: <http://naoce.sjtu.edu.cn/en/>
School: <http://naoce.sjtu.edu.cn/en/>

Project 18

Multidisciplinary Aero-hydro-servo-elastic Analysis of Offshore Floating Wind Turbines

Contact Information

Prof. Dai Zhou
Email: zhou dai@sjtu.edu.cn

Project Description and Objectives

Consequent to Asia's rapid development in wind energy, a demand has arisen to develop a comprehensive medium for high fidelity tools. These tools should be able to address the increasing complexity of offshore concepts, turbine upscaling and wake/wind farm optimization. The aim is to overcome the limitations in existing modelling tools by providing a platform that is capable of capturing non-linear dynamics, unsteady aerodynamics, flow profiles, distributed control surfaces and most importantly, hydrodynamic interactions in a unified description. The challenge is to develop higher-fidelity solutions accompanied by computation efficiency and capabilities within Asia for wind turbine AHSE analysis.

The purpose of this project is to develop a medium to high fidelity description of the aero-hydro-servo-elastic models for offshore wind turbine analysis and to propose an innovative flow control solution and device for improved power and load performance.

Eligibility Requirements

- > Interested students should have basic knowledge of civil engineering or engineering mechanics.

Main Tasks

Finish a research report.
Give two research presentations (a. references review; b. technical presentation).
Submit one paper to a journal as a co-author.

Website

Lab: N/A
School: http://naoce.sjtu.edu.cn/en/teachershow.aspx?info_lb=22&info_id=286&flag=2

Project 19

Vortex Induced Vibration of a Catenary Riser

Contact Information

Prof. Dai Zhou
Email: zhoudai@sjtu.edu.cn

Project Description and Objectives

For this project, three-dimensional spectral/hp computations will be executed to study the fundamental mechanisms of vortex shedding in the wake of a catenary riser at a low Reynolds number of 100. The project will focus on three aspects:

- 1) Flow over a catenary cylinder with a free stream parallel to the plane of curvature. We will numerically investigate the wake dynamics behind the catenary configuration at $Re = 100$ in order to characterize the wake topology. In addition, the evolution of hydro-forces and field variables along the span distance will be examined.
- 2) Wake characteristics of stationary catenary risers with different incoming flow directions. Through the three-dimensional numerical investigation, flow past a freely hanging stationary riser in a catenary shape, where the angle of incoming flow direction with respect to the plane aligned with the CR will range from $\alpha = 0^\circ \sim 90^\circ$ at a low Reynolds number of 100.
- 3) A direct numerical simulation study of flow past a freely vibrating CR/curved circular cylinder. Vortex induced vibration of a long flexible cable at a Reynolds number between 100 and 200, corresponding to laminar and early transitional flow states, will be studied in this project.

Eligibility Requirements

- > Interested students should have basic knowledge of hydrodynamics and numerical simulation.

Main Tasks

Finish a research report.
Give two research presentations (a. references review; b. technical presentation).
Submit one paper to a journal as a co-author.

Website

Lab: N/A
School: <http://naoce.sjtu.edu.cn/en/>

Project 20

Near-infrared Spectroscopy for Discrimination Between Polymethyl Methacrylate and Methyl Methacrylate

Contact Information

Asso. Prof. Jia Li
Email: weee@sjtu.edu.cn

Project Description and Objectives

With the growing use of plastic around the globe, especially in electronic devices, rapid and autonomous plastic sorting processes have become increasingly necessary in the recycling industry. Near-infrared (NIR) spectroscopy has been proven to be an effective tool for sorting in the recycling, agriculture and pharmaceutical fields. However, there is limited information on its effectiveness in sorting two widely used plastics with very similar reflectance spectra's, polymethyl methacrylate (PMMA) and methyl methacrylate (MMA). This study initially introduces spectroscopy as a whole and then explores the use of NIR spectroscopy for discriminating between PMMA and MMA (in the wavelength range of 900-1700 nm). The chemometric method of principal component analysis (PCA) is used to create a model which can be used in the future for automated sorting purposes.

Eligibility Requirements

- > Majors in environmental engineering, chemical engineering, computer science or mathematics are preferred.

Main Tasks

- 1) Build a platform for NIR spectroscopy discriminating.
- 2) Use the method of principal component analysis (PCA) to create a model.
- 3) Finish a research report, give two research presentations (a. reference review; b. technical presentation).

Website

Lab: N/A
School: <http://sese.sjtu.edu.cn:8088/People/1607.html>