Xudong **SHEN**

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Education

National University of Singapore
Singapore

PH.D. STUDENT AT THE GRADUATE SCHOOL FOR INTEGRATIVE SCIENCE AND ENGINEERING — *Aug. 2019 - current*

Zhejiang University
Hangzhou, China

B.ENG. (WITH HONOR) IN NAVAL ARCHITECTURE AND OCEAN ENGINEERING — *Sep. 2015 - Jun. 2019*

- GPA: 3.77/4.0, Ranking: 3^{rd}/31
- Courses: Probability and Mathematic Statistics, ODEs, PDEs, Computational Methods, Physics, {Theoretical, Material, Fluid, Ship, Offshore Structure, Offshore Platform} Mechanics, {Machine, Ship, Offshore Structure, Offshore Platform} Design, Finite Element Analysis and Application, Electrotechnics and Electronics, Accounting, Game Theory, Microeconomics, etc.

Waseda University
Tokyo, Japan

EXCHANGE STUDENT IN THE DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING — *Sep. 2018 - Feb. 2019*

- Global Leadership Program
- Received Master Kong Dream Scholarship
- Courses: Introduction to Logic, Concrete Engineering, Global Asia seminar, Advanced Studies on Global Asia, Global Asia Practicum.

Università di Trento
Trento, Italy

EXCHANGE STUDENT IN THE DEPARTMENT OF CIVIL, ENVIRONMENTAL AND MECHANICAL ENGINEERING — *Feb. 2017 - Jun. 2017*

- ERASMUS+ Student Mobility
- Received ERASMUS+ Student Mobility Grant
- Courses: Design Methods for Industrial Engineering, Scientific Computing (ungraded).

Skills

Languages	Chinese (mother language), English (TOEFL ibt 105), Italian (beginner), Japanese (beginner)
Programming	C, Fortran, Python
Software	MATLAB, AutoCAD, Rhino, SolidWorks, COMSOL Multiphysic, ANSYS, FLUENT
Areas of Interest	Computational Science, Machine Learning, Computer Vision, Social Science, Policy & Politics

Experience

Analysis and Optimization of Hydrodynamically Focused Printing for High-resolution Printed Electronics
Toronto, Canada

UNDERGRADUATE RESEARCHER AT RAPID PROTOTYPING LABORATORY, DEPARTMENT OF ELECTRONIC ENGINEERING & COMPUTER SCIENCE, YORK UNIVERSITY — *May 2018 – Aug. 2018*

- I worked with Prof. Gerd Grau in hydrodynamically focused printing for printed electronics. I worked alongside a team of four researchers. Our work was to develop and optimize a hydrodynamically focused nozzle for a higher resolution in printed electronics.
- My work focused on micron-scale multi-phase flow simulation using COMSOL and FLUENT. As it was predominantly a microfluidic problem, a laminar model was applied. Volume fraction equation was added to track the interfaces between ink, sheath fluid, and air. Continuum surface force method and a physical-based evaporation-condensation model were also implemented. I also included features that were not readily available by self-defined functions, such as contact angle hysteresis and velocity-dependent contact angle. PISO pressure-velocity coupling scheme was employed as the solver, allowing large time steps. Non-Iterative Time Advancement (NITA) further enhanced computational efficiency. Supported by SHARCNET, Canada, the calculation was conducted in a high-performance computing (HPC) environment.

Cloud Detection in Satellite Remote Sensing using Fully Convolutional Neural Network

Hangzhou, China

Undergraduate Researcher at State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography — *Jul. 2017 – Sep. 2017 & Nov. 2018 - Jul. 2019*

- I worked with Prof. Gang Zheng to achieve state-of-the-art cloud detection in satellite remote sensing using CNN approach. We proposed a fully convolutional neural network for cloud and cloud shadow detection in satellite images.
- Dataset was established by manually labeling. Our fully convolutional neural network built on the encoder-decoder structure and incorporated many well-established features, such as skip-layer connection, batch normalization, dropout, and residual module. By using dropout at test time as a way of Monte Carlo sampling, our NN produce pixel-level prediction with a measure of uncertainty. Our method can well recognize broken clouds, thin (cirrus) clouds and their shadow with different underlying surfaces.

A Study of Japan's History, Regulation, and Specific Measures regarding Persistent Organic Pollutants (POPs)

Tokyo, Japan

supervised by Prof. Sachiko HIRAKAWA under Master Kong Dream Scholarship Program — *Sep. 2018 - Feb. 2019*

- I conducted independent research regarding Japan's policies and actions towards the elimination of Persistent Organic Pollutants (POPS) at Waseda University, Japan. My academic supervisor is prof. Sachiko HIRAKAWA.
- POPs are hazardous chemical pollutants of global concern. Japan is one of the global leaders in resolving this issue. I examined Japan's laws, regulations, and specific actions regarding POPs in the past 50 yrs. An attempt was made to analyze the reasons behind its success. Specific proposals were put forward to help other countries, China as an example.

Presentation

2018 Lassonde Undergraduate Research Conference

Toronto, Canada

Poster Presenter for <Analysis and optimization of hydrodynamically focused printing for high-resolution printed electronics> — *Aug. 16, 2018*

- I introduced our research on the three-phase coffee ring effect that resulted in undesirable ink profile in hydrodynamically printed electronics. Insights gained from CFD simulations helped us deepen the understanding of the printing process. Experiments were to be conducted to validate our proposed solutions.

Awards & Scholarships

2019	**University-wide**, NGS scholarship	*National University of Singapore*
2018	**Worldwide**, GLOBALINK Research Internship Award	*Mitacs Canada*
2018	**National**, Master Kong Dream Scholarship	*Tingyi Holdings Corp. & Waseda University*
2017	**Worldwide**, ERASMUS+ Student Mobility Grant	*EU & Università di Trento*
2017	**Provincial**, 3^{rd} Prize in Physics Innovation Competition	*Zhejiang Physical Society*
2017	**University-wide**, Second-Class Scholarship for Outstanding Merits	*Zhejiang University*
2017	**University-wide**, Second-Class Scholarship for Outstanding Students	*Zhejiang University*
2016	**University-wide**, Second-Class Scholarship for Outstanding Merits	*Zhejiang University*