Yingxian Estella Yu

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Innovative Princeton Ph.D. researcher with background in mechanical engineering, applied mathematics, and image & data analysis seeking to apply my passion in discovering hidden gems in various forms of data. Enjoys leveraging background and skill set to support detailed and efficient analysis. Extensive qualification in leading communication, and collaboration across multi-dimensional teams.

-------QUALIFICATIONS------

Technical Skills:

Data Analysis:
Image Analysis | Data Analysis | Pandas | Matplotlib | Seaborn | Scikitlearn | Hadoop

Languages:
Python | Java | MATLAB | SQL | Mathematica | Latex

Graphics & Simulation:
AutoCAD | SolidWorks | Gerris | COMSOL

Experiments:
Soft Lithography | Microfluidics | PIV | Experimental Design | Highspeed imaging

CERTIFICATE

IBM Data Science Professional Certificate

Interpersonal Skills:

Presentation design and delivery for various target audiences; Collaborative

Restorative:
Adept at looking at big picture; Motivated to make changes, upgrades, and improvements

Achiever:
Goal driven; Self-motivated; Enjoy intellectual challenges; Diligent and hardworking

Adaptable:
Quickly learns new subject matter; Comfortable thinking beyond area of specialty

----------EDUCATION----------

Ph.D. in Mechanical and Aerospace Eng., Princeton University, Princeton NJ 2020
Advisor: Howard A. Stone
GPA: 3.92 / 4.00

M.A. in Mechanical and Aerospace Eng., Princeton University, Princeton NJ 2017

B.S. in Mechanical Eng., Boston University, Boston MA, *Summa Cum Laude* 2015

----------SELECTED DATA ANALYSIS PROJECTS----------

Manhattan Apartment Rent Clustering and Classification

- Utilized web scraping to obtain apartment rental price based on Manhattan neighborhoods
- Applied machine learning skills to explained regional rental price trend based on the venue data in each neighborhood, obtained from FourSquare API

Search Engine AutoComplete

- Used Hadoop MapReduce to generate a Markov model for the following word (NGram) based on a collection of literature
- Wrote interactive autocomplete input box based on the user's input, providing the next 5 most probable following word

Determining Avogadro const. from Image and Data Analysis

- Wrote Java objects to analyze the Brownian motion of micron particles
- Used depth-first search to identify particles above threshold, analyzed the displacements of all particles (2,000 images) and deduced the Avogadro constant.

----------RESEARCH----------

Complex Fluids Group, Princeton University, Princeton NJ 2015 – 2020
Graduate Research Assistant -- *Eli and Britt Harari University Fellow*

- Invented (and patenting) an innovative micro-particle sorting and separation technology through scientific methodology design and development, image and data analysis, and leading a multidimensional team cooperation
- Investigated gravidity current spreading and leakage dynamics, providing theoretical and numerical insights to predict the performance of Carbon Dioxide (CO_2) underground storage action.

DAMTP, University of Cambridge, Cambridge UK May - July 2018
Visiting Research Fellow – *David Crighton Fellow*

- Pioneered in investigating micro-organisms' bioluminescence phenomena under sheer in microfluidic devices, with future potentials in developing a bioinspired shear sensor

Fluid Lab, Boston University, Boston MA 2013 – 2015
Research Assistant – *SURF Scholarship & Lutchen Distinguish Fellow*

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ACHIEVEMENTS

5 Journal publications
6 Conference presentations
2 Invited Seminars
2 Funded Grant Proposal
1 Invention Disclosure
1 Pending Patent Application

SELECTED HORNOR

- Caltech Young Investigator Lecturer
- Mary and Randall Hack '69 Award
- Larisse Rosentweig Klein Memorial Award
- David Crighton Fellowship
- Eli and Britt Harari University Fellowship
- National Science Foundation Training Grant
- Princeton University Fellowship

Additional Skills: Motivated self-starter; Superb organization and time management; Detail oriented; Meets deadline; Experienced at navigating and summarizing scientific literature; Proven written and oral communication skills

SELECTED PUBLICATIONS

PRESENTATIONS

- Department of Mechanical and Civil Engineering, Caltech -- ***Invited Seminar Young Investigator Lecture*** 2019
- 71th Annual Meeting of APS DFD -- ***Conference Presentation*** 2018
- Department of Mathematics, University of Oslo, Norway -- ***Invited Talk*** 2018
- 70th Annual Meeting of APS DFD -- ***Conference Presentation*** 2017
- 91th ACS Colloid & Surface Science Symposium -- ***Conference Presentation*** 2017

Publications

(Google scholar: https://scholar.google.com/citations?user=TH4Rk5sAAAAJ&hl=en)

- ***Yu***, Zhu, Shim, Eggers, and Stone, 2018. *J. Fluid. Mech*. 857, R4.
- Brasz, Bartlett, Walls, Flynn, ***Yu***, and Bird, 2018. *Phys. Rev. Fluids* 3, 074001.
- ***Yu***, Khodaparast, and Stone, 2018. *Appl. Phys. Lett.*, 112.18, pp.181604.
- ***Yu***, Khodaparast, and Stone, 2017. *Soft Matter*, 13(15), pp.2857-2865.
- ***Yu***, Zheng, and Stone, 2017. *Phys. Rev. Fluids*, 2(7), 074101

LEADERSHIP

Teaching

Lead Assistant Instructor (MAE305) Fall 2017, 2018

- Gave review sections and a regular lecture to a class of 100+ undergraduate students.
- Designed educational presentation and activities introducing technical mathematical concepts.
- Led a group of graduate assistant instructors for AI meetings, grade management, exam proof-read and grading.

Assistant Instructor (MAE552) Spring 2018

- Assisted teaching in advanced theoretical fluid mechanics course for graduate students.
- Hosted weekly office hours supervising students in solving problem sets.
- proofread and graded problem sets and exams.

Mentoring

Complex Fluids Group, Research Mentor (1 *Senior Thesis*, 1 *Junior* and 1 *Summer Research*)

- Supervised multiple undergraduate students for research projects with different learning styles
- Guided students through theoretical understanding, experimental design, image analysis, data analysis, figure development and presentation design and delivery.

OUTREACH

Harlem Prep to Princeton, Princeton University, MAE April 2016, 2017, 2018

- Design and presented scientific bench-top outreach experiments to elementary school students from Harlem Prep.

Holiday Lecture in Princeton community, Princeton, PRISM Dec 2016, 2017, 2018

- Assist in preparation of holiday science lecture for the general audience in the Princeton community

NanoDay Volunteer, Boston Museum of Science Nov 2014