Yuchen Guo

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EDUCATION

The Chinese University of Hong Kong August 2020 - present
Ph.D. in Mathematics, Supervisor: Ronald Lok Ming Lui
Research Interests: Computational Differential Geometry, Medical Imaging, 3D Imaging, Surface Registration Problems and Machine Learning.

Hunan University September 2016 - June 2020
Bachelor of Science in Applied Mathematics

University of California, Los Angeles June 2019 - September 2019
Cross-disciplinary Scholars in Science and Technology (CSST) Program

PUBLICATIONS

- **Yuchen Guo**, Hanqun Cao, and Lok Ming Lui, *Registration and Recognition of Partial Face via Quasi-conformal Geometry and Machine Learning*, Submitted to Pattern Recognition.
- **Yuchen Guo**, Qiguang Chen, Gary Choi, and Lok Ming Lui. *Automatic Landmark Detection and Registration of Brain Cortical Surfaces via Quasi-Conformal Geometry and Convolutional Neural Networks*, Computers in Biology and Medicine, 2023:107185.
- **Yuchen Guo**, Mengqi Chen, Xiao-Bao Shu and Fei Xu, *The existence and Hyers-Ulam stability of solution for almost periodical fractional stochastic differential equation with fBm*, Stochastic Analysis and Applications, 39(4), 643-666. ***Highly Cited Paper***.
- **Yuchen Guo**, Xiao-Bao Shu, Yongjin Li and Fei Xu, *The existence and Hyers–Ulam stability of solution for an impulsive Riemann–Liouville fractional neutral functional stochastic differential equation with infinite delay of order* $1<\beta<2$, Boundary Value Problems, 2019(59). ***Highly Cited Paper.***
- **Yuchen Guo**, Nicholas Haonian, Zhexiao Lin, Nicholas Liskij, Hanbaek Lyu, Deanna Needell, Jiahao Qu, Henry Sojico, Yuliang Wang, Zhe Xiong and Zhenhong Zou, *Topic-aware chatbot using Recurrent Neural Networks and Nonnegative Matrix Factorization*, arXiv preprint arXiv: 1912.00315.
- **Yuchen Guo** and Xiao-Bao Shu, *An investigation on the existence and Ulam stability of solution for an impulsive fractional differential equation*, Journal of Mathematics, 2019, 39(06): 835-851.

RESEARCH EXPERIENCE

The Chinese University of Hong Kong August 2020 - present
Under the supervision of Prof. Ronald Lok Ming Lui

- *3D Brain Cortical Surfaces Sulci Detection and Registration*
  - Proposed a learned framework for the automatic sulci detection and registration of brain cortical surfaces using quasi-conformal geometry and convolutional neural networks.
  - Able to compare the difference between brains for disease diagnosis.
- *3D Partial Face Surface Landmark Detection and Registration*
  - Proposed a learned framework for parameterization, facial landmark detection, registration and recognition of partial face using quasi-conformal geometry and convolutional neural networks.
  - Able to determine the location and the existence of prominent points on the partial face.
  - Could compare different partial faces and perform facial recognition even with few overlapping.

University of California, Los Angeles June 2019 - September 2019

Under the supervision of Prof. Deanna Needell and Dr. Hanbaek Lyu

- Created a topic-aware chatbot by using recurrent neural network, non-negative matrix factorization as well as the attention mechanism.
- Mainly worked on the structure of the chatbot in order to make the chatbot to be topic-aware and sought ways to boost computing speed in training and generating process.

Hunan University February 2018 - October 2019

Under the supervision of Xiaobao Shu

- Learned the basic theorems of the stochastic differential equation.
- Conducted research on the existence and Hyers-Ulam stability of solutions for Riemann-Liouville fractional stochastic differential equations and Caputo fractional stochastic differential equations.
- Published three papers as the first author. Two papers are listed among highly cited papers.

WORK EXPERIENCE

Huawei Hong Kong Research Center July 2023 - Jan 2024

Position: Research Intern

- Algorithm design and implementation of ultrasound communication for data transmission.
- Conducting research on error-correcting codes in ultrasound communication.

SERVICE &MEMBERSHIP

- Reviewer for *Journal of Inequalities and Applications*, 2022.
- Reviewer for *FILOMAT*, 2021.
- Member of *Society for Industrial and Applied Mathematics student chapter*, 2023.

ACADEMIC AWARDS

- **International Congress of Chinese Mathematicians Best Thesis Award**, *Silver Medal [2022].*
- **Outstanding Graduates**, *Hunan Province [2020].*
- **Outstanding Graduation Thesis**, *Hunan University [2020].*
- **Cross-Disciplinary Scholars in Science and Technology Scholarship**, *University of California, Los Angeles [2019].*
- **The Challenge Cup - National Technological Innovation Competition**, *National Second Prize [2019].*

SKILLS

- **Programming** Python, Matlab, C
- **Machine Learning** Pytorch
- **Paper Writing** Latex

EXTRACURRICULAR AWARDS

- **Merit Student**, *Hunan University [2017, 2018, 2019].*
- **Outstanding Accomplishment and Service as a Valued Volunteer**, *Child Education Development, Sri Lanka [2017].*