

# Yuchen Guo

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## EDUCATION

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**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

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- **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*, arXiv preprint arXiv:2208.07010. Submitted to IEEE Transactions on Medical Imaging.
- **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**, 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** 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

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**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 and registration 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 difference between partial faces 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.

## SERVICE & MEMBERSHIP

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- 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

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- **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

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

## EXTRACURRICULAR AWARDS

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