Henry Shaowu Yuchi

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Georgia Institute of Technology, Atlanta GA, USA

Education

ISyE, Georgia Institute of Technology ***Atlanta, GA***

PhD in Machine Learning (Statistics) *2018-2023 (Expected)*
Advisors: Dr Yao Xie & Dr Jeff Wu | *GPA 4.0/4.0*

Magdalene College, University of Cambridge ***Cambridge, UK***

BA & MEng in Computer & Information Engineering | *Grade: Class I & Distinction* *2014-2018*

The University of Hong Kong ***Hong Kong***

Joint admission program with University of Cambridge *2013-2014*
BEng (First Year) | *GPA: 3.80/4.30* | *Core GPA: 4.20/4.30*

Research Projects

Strategic Environmental Research & Development Program with DoD ***2019-Now***

- Modeling aircraft coating degradation and corrosion process with marked temporal point process;
- Physics-based surrogate modeling for streaming sensor data and change detection;
- Processing & analyzing large data sets and data visualization;
- Close collaboration with industrial partners including Luna, Boeing, and USAF.

Credit Card Fraud Detection with Macy's ***2018-2019***

- Modeling streaming credit card transaction data with marked spatio-temporal point process;
- Credit card fraud detection in real-time using change detection techniques;
- One-class change detection with generative adversarial network.

Awards

- American Statistical Association SPES & QP Student Paper Competition Award 2021;
- Georgia Tech IDEaS-TRIAD Graduate Research Fellowship 2020;
- Cambridge International Trust Scholarship 2014-2018;
- Magdalene College Prize for Engineering 2017, 2018;
- Magdalene College Scholarship 2015, 2016, 2017, 2018.

Teaching Experiences

Lecturing, assignment and exam grading, & office hours.

- Fall 2018 Teaching Assistant for ISYE2028 Statistical Methods;
- Spring 2019 Teaching Assistant for ISYE6416 Computational Statistics.

Publications

- Yuchi, H. S., Repasky, M., Ligonde, G. K., Bassiri-Ghard, N., & Xie, Y. (2021), Denoising Piezoresponse force Microscopy Data Using Bayesian Low-Rank Matrix Completion. (Submitted to 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)).

- Yuchi, H. S., Joseph, V. R., Wu, C. F. J. (2021), Finite Element Simulations with Multiple Mesh Density Parameters. (Presented at JSM 2021, to be submitted).

- Yuchi, H. S., Mak, S., & Xie, Y. (2021), Bayesian Uncertainty Quantification for Matrix Completion. Retrieved from https://arxiv.org/abs/2101.01299 (Presented at INFORMS 2021, to be submitted).

- Mak, S., Yuchi, H. S., & Xie, Y. (2021), Information-Guided Sampling for Low-Rank Matrix Completion. *ICML 2021 Workshop on Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning*.

- Kacher, J., Xie, Y., Voigt, S. P., Zhu, S., Yuchi, H. S., Key, J., Kalidindi, S. R. (2021), Signal Processing Challenges and Examples for *in-situ* Transmission Electron Microscopy (Accepted by IEEE SPM Special Issue on Signal Processing for Advanced Materials).

- Zhu, S., Yuchi, H. S., Zhang, M., Xie, Y. (2021), Sequential Adversarial Anomaly Detection with Deep Fourier Kernel. *2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*.

- Zhu, S., Yuchi, H. S., Xie, Y. (2020), Adversarial Anomaly Detection for Marked Spatio-Temporal Streaming Data. *2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*.

- Seshadri, P., Yuchi, S., Parks, G. T., & Shahpar, S. (2020), Supporting multi-point fan design with dimension reduction. *The Aeronautical Journal*, 124 (1279), 1371-1398.

- Seshadri, P., Yuchi, S., & Parks, G. T. (2019), Dimension reduction via Gaussian ridge functions. *SIAM/ASA Journal on Uncertainty Quantification*, 7(4), 1301-1322.

Experience

Student Researcher, Department of Engineering — *Cambridge, UK*

Dimension Reduction in Turbomachinery Design — *Jul 2017-Jun 2018*
Combined with Undergraduate Research Opportunity Project — *Jul-Oct 2017*
Sponsored by Rolls-Royce Plc

- Turbomachinery and Computational Fluid Dynamics, geometry generation, meshing & Reynolds-averaged Navier–Stokes equations (RANS);
- Estimation and uncertainty quantification for computational models of turbo blade designs;
- Gaussian process regression and dimension reduction techniques including active subspaces, minimum average variance estimation (MAVE) and manifold optimization.

Summer Student Intern, Rolls-Royce Plc — *Derby, UK*

Impact Analysis on Turbomachinery Blades — *Jun-Sep 2016*

- Fan blade impact response modeling for composite blade delamination by finite element method driven computational simulations;
- Sensitivity analysis between impact response and parameterized structural designs;
- Model reduction by optimization and regression;
- Estimation and inference of blade delamination from reduced model.

Summer Student Intern, Reveal Media Ltd — *London, UK*

Software Engineering & Product Development — *Aug-Oct 2015, Sep-Oct 2016*

- Product development for UK national police force: body camera technology;
- Software development for customer interface with C++;
- System commissioning on location.

Summer Student Intern, Granta Design Ltd — *Cambridge, UK*

Material Science, Engineering & Education — *Jun-Aug 2015*

- Translation of material science and engineering lecture notes and texts into simplified and traditional Chinese for high school and college students;
- Translation of video tutorial scripts and subtitles for the company material science education software;
- Communications between university faculties and students from China, Hong Kong and Taiwan for user experience and suggestions.