Botong Miao
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Education

Ph.D. – Materials Engineering 2016 – 2022
McGill University, Montreal, QC, Canada
Master of Science – Mathematics and Physics 2012 – 2015
University of Science and Technology Beijing, Beijing, China
Bachelor of Science – Mathematics and Physics 2008 – 2012
University of Science and Technology Beijing, Beijing, China

Research Experience

McGill University 2016 – 2022

Ph.D. Researcher

- Contributed to developing, testing, and implementing analytical and numerical codes with statistics and linear algebra algorithms to figure out low efficiency factors of devices and provide optimal strategies for experimental partners
- Designed anomaly detection models based on machine learning algorithms for large datasets filter (using techniques: data integration, transformation, reduction, and cleaning, and model selection, training, evaluation, and deployment) to improve data analysis and management efficiency
- Built an interactive dashboard for experimental data input and adjustment to increase data integration efficiency
- Designed models based on machine learning algorithms and techniques in the second bullet for large datasets management and visualization for experimental partners to increase data analysis efficiency
- Presented findings at national and international conferences (Computational Materials North Conference and Materials Research Society Conference)
- Interpreted technical materials to non-technical audience/students at conferences/seminars
- Mentored 5 undergraduate and graduate student projects to support their professional and personal development
- Authored a book chapter on Conversion of Water and CO_2 to Fuels using Solar Energy and published three first-author papers in peer reviewed journals

University of Science and Technology Beijing & Institute of Physics at Chinese Academy of Science

Master's Researcher 2012 – 2015

- Designed analytical codes/algorithms for large datasets analysis and visualization for local industry partner to increase data management efficiency
- Designed anomaly detection algorithms for analyzing large datasets of strain and stress on dams to efficiently figure out specific points
- Delivered weekly physics seminars to peers and department colleagues
- Mentored undergraduate student projects to support their professional and personal development
- Published one first-author paper in a peer reviewed journal

University of Science and Technology Beijing & Institute of Physics at Chinese Academy of Science

Undergraduate Researcher 2010 –2012

- Designed anomaly detection and visualization codes/algorithms for analyzing large datasets to figure out superconductivity temperatures of materials for experimental partners
- Delivered weekly physics seminars to peers and department colleagues

Work Experience

McGill University, Department of Materials Engineering Sep. 2018 – Apr. 2022

Teaching Fellow (Properties of Materials in Electrical Engineering; Modelling and Automatic Control)

- Assisted in teaching undergraduate courses ranging in size from 35-110 students
- Evaluated students' assignments and designed formula for grades' calculation and management

University of Science and Technology Beijing, Basic Experimental Center for Natural Science Aug. 2015 – Jan. 2016

Experimental Lab Assistant

- Contributed to optimizing data visualization for the software of electrical measurement devices
- Assisted in teaching undergraduate laboratory courses (20-30 students/course)

Institute of Physics at Chinese Academy of Science Jan. 2015 – July 2015

Research Assistant

- Optimized microcircuits on the superconductivity and high-pressure Raman spectroscopy devices
- Designed analytical codes/algorithms for large datasets analysis for local industry partner to increase data management efficiency

Skills

Programming Language: Python, Matlab

Computer: Machine Learning Skills and Tools (Scikit-learn, TensorFlow, PyTorch, Pandas, Numpy, Matplotlib), Object-detection Model, Cloud-based Services (Azure), Statistical/analytical Modeling, Data and Quantitative Analysis, Linux Operating System

Additional Certifications

- IBM Data Science Professional Certificate
- Machine Learning with Python Certificate

Selected Publications & Conference Presentations

- **B. Miao**, S. Wang, P. Kong, et., Chinese Physics B, 2015, 24, 017403.
- **B. Miao**, A. Iqbal, and K. H. Bevan, The Journal of Physical Chemistry C, 2019, 123, 28593.
- **B. Miao**, K. Sangaré, A. Iqbal, B. Marsan, and K. H. Bevan, Physical Chemistry Chemical Physics, 2020, 22, 19631. (2020 Hot Article)
- K. Li, **B. Miao**, W. Fa, R. Chen, J. Jin, K. H. Bevan, and D. Wang, ACS Applied Materials & Interfaces, 2021, 13, 17420. (Co-first author with K. Li)
- K. H. Bevan, **B. Miao**, A. Iqbal, Computer Physics Communications, 2023, 286, 108638.
- K. H. Bevan, **B. Miao**, A. Iqbal, Conversion of Water and CO_2 to Fuels using Solar Energy: Science, Technology and Materials, John Wiley & Sons. (Book)

Conference Paper and Presentation:

- **B. Miao**, Computational Materials North Conference, Ottawa, Canada, 2019. (Oral Presentation)
- **B. Miao**, Materials Research Society Conference, Boston, United States, 2019. (Poster Presentation)

Awards

- Elite Scholarship by USTB (2011)
- Excellent "Three Good" Student (2011),
- Outstanding Undergraduate Student (2012)
- Excellent Senior Undergraduate Rewards (2012),
- "Three Good" Graduate Student (2013)
- 1st Prize for Outstanding Thesis in 10th Academic Forum (2014)
- Excellent "Three Good" Graduate Student (2014)
- Outstanding Graduate Student (2015),
- McGill Engineering Doctoral Awards (2016 –2019)