YONGZHONG LI

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Education

- ***University of Toronto (UofT)*** — Ontario, Canada
  Electrical and Computer Engineering (Electromagnetics) — *MASc. 2021-2023(expected)*
  Supervisor: *Prof. Piero Triverio*

- ***Beihang University (BUAA)*** — Beijing, China
  Electronic Information Engineering — *B.S. 2016-2020*
  Bachelor Thesis in Computational Electromagnetics
  Supervisor: *Prof. Qiang Ren*
  - *Outstanding Bachelor Thesis Award (5/339)*
  - *College Graduate Excellence Award*

Research Interests

- **Primary**: Multiphysics modeling (Electromagnetics, Thermal, Acoustics), Wave functional Materials and Machine learning
- **Broad**: Scientific and High Performance Computing

Book

Qiang Ren*, Yinpeng Wang, **Yongzhong Li**, Shutong Qi, Sophisticated Electromagnetic Forward Scattering Solver via Deep Learning, **Springer**, Singapore, 2022

Journal (Chronologically)

Yongzhong Li, Jiawei Xi, Leung Ka Wun Casey, Tan Li, Wing Yim Tam, Jensen Li*, Imaging by Unsupervised Feature Learning of Wave Equation, **Physical Review Applied**, 2021, *Accepted*

Yongzhong Li, Yinpeng Wang, Shutong Qi, Qiang Ren*, Lei Kang, Sawyer D. Campbell, Ping Werner, Douglas H. Werner, Prediction scattering from complex nano-structure's via deep learning, **IEEE Access**, 8: 139983 - 139993 (2020)

Guorui Chen, **Yongzhong Li**, Bick Michael, Jun Chen* Smart textile for electricity generation, (Front Main Cover), **Chemical Review** (IF: 54.3), 120(8), 3668 - 3720 (2020)

Shutong Qi, Yinpeng Wang,**Yongzhong Li**, Xuan Wu, Qiang Ren*, Ren Yi, 2D Electromagnetic Solver Based on Deep Learning Technique, **IEEE Journal on Multiscale and Multiphysics Computational Techniques**, 5,83-88 (2020)

Nannan Zhang†, Fang Huang†, Shenlong Zhao, Xinghao Lv, Yihao Zhou, Siwei Xiang, Shumao Xu, **Yongzhong Li**, Guorui Chen, Changyuan Tao, Yi Nie*, Jun Chen*, Xing Fan* Photo-Rechargeable Fabrics as Sustainable and Robust Power Sources for Wearable Bioelectronics, **Matter (Cell Press)**, 2(5), 1260-1269 (2019)

Cheng Yan, Yuyu Gao, Shenlong Zhao, Songlin Zhang, Yihao Zhou, Weili Deng*, Ziwei Lia, Gang Jianga, Long Jin, Guo Tian, Tao Yang, Xiang Chu, Da Xiong, Zixing Wang, **Yongzhong Li**, Weiqing Yang*, Jun Chen* A Linear-to-Rotary Hybrid Nanogenerator for High-Performance on Body Biomechanical Energy Harvesting, **Nano energy** (IF: 15.4), 67, 104235 (2019)

Conference

Yinpeng Wang, **Yongzhong Li**, Shutong Qi, Qiang Ren* Electromagnetic Scattering Solver for Metal Nanostructure via Deep Learning, **PIERS**, Hangzhou, 2021

Research Experience

- **The Hong Kong University of Science and Technology** — *Hong Kong SAR, China*
- **Photonics, Metamaterials, & Electromagnetics Lab**
  Research Assistant - Prof. Jensen Li — *Sep 2020 - Sep 2021*
  - **Imaging in Wave Systems**: Imaging by unsupervised feature learning of wave equations (acoustics, photonics, fluids), knowledge discovery on complex wave propagation data, physics-informed modeling for inverse problem.
  - **Experimental Physics**: Vibration analysis of elastic wave system, hands on experience of laser doppler vibrometers.
- **Beihang University** — *Beijing, China*

- **Computational Physics Research Lab**
  Research Assistant - Prof. Qiang Ren *May 2018 - Aug 2020*
  - **Computational Electromagnetics**: Scattering predictions from isolated nano-structures in near field regime via Finite Difference Frequency Domain method.
  - **Scientific Machine Learning**: Data-driven modeling of scattering in nano-photonics system, computational acceleration via neural network and GPU parallel computing (three-orders-of-magnitude).
  - **Thermal Modeling**: Nonlinear inverse heat conduction problem solved by three-dimensional spectral elements time domain method and conjugated gradient descent method.
- **University of California, Los Angeles** *Los Angeles, CA*
- **Wearable Bioelectronics Research Lab**
  Visiting Student - Prof. Jun Chen *July 2019 - October 2019*
  - **Smart Textile**: Reviewed the textile-based wearable electronics for energy harvesting in the ambient environment.
  - **Nanogenerator**: Constructed sophisticate electronic devices to greatly improve the efficiency of low-frequency on-body biomechanical energy harvesting based on triboelectric and electromagnetic effect.

Honors and Awards

- Edward S. Rogers Sr. Graduate Scholarships, University of Toronto
- 2020 Redbird Fellowship, HKUST
- 2019 **&** 2018 Innovation Scholarship for Undergraduate Students **First Prize**
- 2019 Innovation Scholarship for Undergraduate Students **First Prize**
- 2019 Academic Scholarship for Undergraduate Students **Second Prize**
- 2019 The Elite Undergraduate Training Program of Dept. of Electrical Engineering of BUAA **(40/300+)**
- 2018 COMAPs Mathematical Contest in Modeling (MCM/ICM) **Meritorious Winner (Top 10% Out of World Competitors)**
  - **Multi-Objective Programming**: Proposed a solution for locating Electrical Vehicles charging stations by using multi-objective evolutionary optimization algorithm.
- 2019 Beijing Integrated Circuit Design Competition **First Prize (3%)**

Selected Coursework

- Electromagnetics Theory
- Experimental Physics (2 courses)
- Circuits Analysis
- Microwave Technology
- Introduction to Machine Learning
- Electro and Magneto Statics
- Modern Semiconductor Physics
- Electronic circuits (2 courses)
- Mathematical Methods in Physics
- Electronic Design Lab (4 courses)

Skills

- **Programming Languages**: Python, C, C++, Verilog, VHDL
- **Packages for Scientific Computing**: SciPy, SymPy, Pandas, Tensorflow, Pytorch, FEniCS
- **Tools**: Matlab, COMSOL Multiphysics, Mathematica, SPICE
- **Hardware Experience**: Laser Doppler Vibrometer, Microcontroller, FPGAs, Raspberry Pi, Oscilloscopes, Multimeters

Teaching Experience

- **Teaching Assistant** Hong Kong SAR, China
  PHYS 1115 Laboratory for General Physics II *June 2021 - Aug 2021*
  - **Lab Duties**: Worked directly with lead teacher and technician to deliver course contents, supervised lab session while maintained accurate records including students' performance, progress and attendance.
  - **Management Experience**: Ensured the lab is set up ready for the days learning and remain a safe and comfortable for students learning, with experience in both in-person and online teaching mode.
  - **Grading**: Graded reports of students' data analysis, assisted in answered students' question in office hours and gave feedback for their strengths and weaknesses.
- **Undergraduate Research Mentor** Beijing & Hong Kong, China
  Beihang University & HKUST *June 2020 - Aug 2021*
  - **Beihang University**: Mr. Nianru Wang, Project: Sophisticated Electromagnetic Forward Scattering Solver via Deep Learning. Now at Delft University of Technology.
  - **HKUST**: Mr. Leung Ka Wun Casey, Project: Imaging by Unsupervised Feature Learning of Wave Equation. Now at The Hong Kong University of Science and Technology.

Professional Service

- **Journal Reviewer**: Microwave and Optical Technology Letters, 2019