Patrick Langechuan Liu

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EDUCATION

University of Michigan, Ann Arbor MI, USA
PhD Candidate in Physics | GPA: **4.0/4.0** 2008-2014

- Coursework: • Medical Imaging Systems (**A+, ranked 1st in class**) • Principles of Radiation Imaging
  • Special Topics on Image Reconstruction Methods • Computational Radiation Imaging
- GRE score: Physics 990/990, Quantitative 800/800

Peking University Beijing, China
Bachelor of Science in Physics | GPA: **3.7/4.0** 2004-2008

RESEARCH EXPERIENCE

Research Assistant Ann Arbor, MI
Department of Radiation Oncology, University of Michigan 2009-2014

- Establish optimization guidelines for design of megavoltage X-ray detectors for radiotherapy imaging
- Design and conduct high-efficiency numerical modeling of detectors through parallel Monte Carlo simulation
- Perform empirical evaluations on detector prototypes based on various high-density scintillating materials
- Work extensively with various Medical Imaging simulation packages including EGSnrc, PENELOPE, GEANT4
- Communicate and collaborate closely with researchers and consultants across research institutes

Graduate Student Instructor Ann Arbor, MI
Department of Physics, University of Michigan 2008-2009

- Delivered independently prepared physics lectures to over 150 students and rated as Excellent Instructor
- Tutored Mechanics and Electromagnetism physics labs, graded lab reports and research project papers

ACTIVITIES

Management Consulting Trainee Chicago, IL
McKinsey & Company, Boston Consulting Group 2011, 2012

- Selected as one of the only three University of Michigan candidates for two on-site training programs
- Collaborated with trainees from various cultural backgrounds on business case analysis and presentations

Entrepreneur Ann Arbor, MI
Center for Entrepreneurship, University of Michigan 2012

- Led a team of three students to develop prototype and business model for a compact multi-fuel motorcycle kit
- Conducted over 50 customer interviews; Pivoted product design and business plan based on interview analysis
- Established partnership with occupational education program at Washtenaw Community College (Ann Arbor, MI)

Volunteer Translator Ann Arbor, MI
DAOLAN Group (The most famous non-profit documentary subtitle group in China) 2009-2010

- Translated 7 feature-length documentaries by NHK (Japan Broadcasting Corporation) into Chinese
- Bridged information gap due to language barrier and television program censorship
- Collaborated online with other volunteers from all over the world

Project Manager Beijing, China
Comics Club T-shirt Project 2008

- Initiated a customized T-shirt design contest to promote Peking University Comics Club
- Reduced cost by 50% through creation of online ordering tools and negotiation for competitive quotes
- Profited $300 from over 1000 orders, which was donated to Relief Fund for the 2008 Sichuan Earthquake

SKILLS AND INTERESTS

Computer Skills: Unix Shell, C/C++, FORTRAN, Matlab, Python, Parallel Computing, LaTeX, HTML/CSS
Languages: Chinese (Native), Japanese (Fluent), Spanish (Intermediate)

- Translated **first two** seasons of *the Big Bang Theory* into Chinese and promoted the show in China
- Japanese Language Proficiency Test (**JLPT Level 1**) **393**/400

Interests: Golf, Badminton, Table Tennis, Translation, Calligraphy, Typography, Linguistics, Manga

PUBLICATION

Peer-reviewed:

- **L Liu**, L Antonuk, Y El-Mohri, H Jiang, Q Zhao, "Optimization of the design of thick, segmented scintillators for megavoltage cone-beam CT using a novel, hybrid modeling technique", *Medical Physics* (Submitted)
- Y El-Mohri, L Antonuk, R Choroszucha, Q Zhao, H Jiang, **L Liu**, "Optimization of the performance of segmented scintillators for radiotheraoy imaging through novel binning technique", *Physics in Medicine and Biology*, 2013 (Accepted)
- Y El-Mohri, L Antonuk, Q Zhao, R Choroszucha, H Jiang, **L Liu**, "Low-dose megavoltage cone-beam CT imaging using thick, segmented scintillators", *Physics in Medicine and Biology*, 56 (2011) 1509-1527
- **L Liu**, L Antonuk, Q Zhao, Y El-Mohri, H Jiang, "Countering Beam Divergence Effects with Focused Segmented Scintillators for High DQE Megavoltage Active Matrix Imagers", *Physics in Medicine and Biology*, 57 (2012) 5343-58

Conferences:

- **L Liu**, L Antonuk, H Jiang, Y El-Mohri, Q Zhao, "Optimization of the design of portal imaging systems incorporating thick, segmented scintillating detectors employed for megavoltage cone-beam CT through a novel hybrid modeling technique", Physics in Medicine and Biology, *RSNA 2013*, SST15-06
- L Antonuk, Y El-Mohri, Q Zhao, **L Liu**, H Jiang, "Implications of Orders-of-Magnitude Improvement in DQE Performance of Conventional Electronic Portal Imagers", *RSNA 2012*, LL-PHS-TH2B
- L Antonuk, **L Liu**, Q Zhao, Y El-Mohri, H Jiang, R Street, "Investigation of Novel, Focused, Segmented Scintillator Geometries for High DQE Megavoltage Active Matrix Imagers", *AAPM 2011*, Radiography/Projection Imaging Section, SU-C-220-6
- Q Zhao, **L Liu**, Y El-Mohri, L Antonuk, H Jiang, M Koniczek, "Theoretical Limits to System Performance of High Efficiency, Direct Detection, Megavoltage Active Matrix Flat-Panel Imagers Based On Polycrystalline Mercuric Iodide", *AAPM 2010*, Imaging General Section, SU-GG-I-136

HONORS

Rackham Travel Grant — Ann Arbor, MI
University of Michigan — 2013

First Place in Michigan Japanese Language Speech Contest (University Category) — Detroit, MI
Consulate-General of Japan in Detroit — 2011

- Awarded round-trip airplane ticket ($1500) from Detroit to Tokyo

Rackham Travel Grant — Ann Arbor, MI
University of Michigan — 2011

Outstanding Graduate (top 10/200) — Beijing, China
Peking University — 2008

DTZ(Hong Kong) Scholarship — Beijing, China
Peking University — 2007

POSCO(South Korea) Scholarship — Beijing, China
Peking University — 2006

All-Around Excellent Student — Beijing, China
Peking University — 2006

POSCO(South Korea) Scholarship — Beijing, China
Peking University — 2005

President's Fellowship for Undergraduate Research — Beijing, China
Peking University — 2005

Dean's Award for Academic Excellence (top 2%) — Beijing, China
Peking University — 2005