**Patrick Langechuan Liu, PhD**

4015 Carmel View Road #188, San Diego, CA

(+1) 734-277-1381 <liulangechuan@gmail.com> [linkedin.com/in/langechuan](https://www.linkedin.com/in/langechuan)

WORK EXPERIENCE

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| **Staff Research Scientist** | San Diego, CA |
| *12 Sigma Technologies* | Nov 2017 – Current |

* Develop cutting-edge deep learning algorithm for various medical imaging applications.

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| **Application Development Engineer – Machine Learning Solutions** | Pleasanton, CA |
| *Carl Zeiss, AG* | May 2017 – Oct 2017 |

* Created and pitched development strategies of machine learning applications in corporate summit meeting.
* Researched and developed deep learning applications for automatic defect detection and image segmentation.
* Optimized and automated semiconductor near-line measurement workflow for X-ray microscopy, and performed gauge studies to ensure repeatability and reproducibility.

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| **Senior Detector Physicist** | Santa Clara, CA |
| *PerkinElmer Medical Imaging* | Feb 2015 – May 2017 |

* Led engineering teams to design and test various amorphous silicon and CMOS detectors for X-ray imaging
* Automated X-ray image classification using deep learning techniques (CNNs) with TensorFlow library, increasing specificity from below 10% to above 80% while maintaining extremely high sensitivity above 99%
* Increased X-ray detector spatial resolution by 80%+ by adopting a barrier rib structure in the scintillator layer; presented the results to senior management as well at international conference in medical imaging
* Invited as associate editor and judge to peer review 90+ manuscripts from 10+ journals in Image Processing and Medical Imaging

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| **Data Science Fellow** | San Francisco, CA |
| *The Data Incubator* | Summer 2015 |

* Performed sentiment analysis through construction of bag-of-words and bigram models based on more than 1 million Yelp reviews using Scikit-learn library in Python
* Predicted business star-rating through linear regression of the features extracted from 30,000+ Yelp records
* Constructed and analyzed a social network of celebrities in NYC using data scraped from 1200+ webpages
* Performed time series forecasting for daily averaged oil spot price using historical data retrieved from Quandl
* Revealed network connections among Wikipedia pages by analyzing internal wiki-links on all simple English and Thai pages (10 GB+ of HTML files stored on Amazon Web Service) using MapReduce in mrjob framework

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

* Conducted Monte Carlo simulation of various X-ray detector designs on an 800 CPU-core cluster built in house
* Designed and implemented cone-beam CT reconstruction algorithm and volumetric image analysis in MATLAB
* Invented a hybrid modeling framework to reduce simulation time from 100 million down to only 30 CPU hours
* Pioneered design optimization of megavoltage X-ray detectors for radiotherapy portal imaging and MV CBCT

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| **Management Consulting Trainee** | Chicago, IL |
| *McKinsey & Company* | Summer 2011 |

* Created a multivariate regression model to predict sales for a cosmetics company with declining sales in Excel
* Proposed and pitched a solution for increasing sales by ~20% based on the analysis to an executive panel

EDUCATION

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

* Thesis Topic: Cone-beam CT Image Processing and Radiotherapy Imager Design

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

SKILLS & INTERESTS

* Computer Skills: Python, Matlab, Unix Shell Scripting, C, C++, SQL, Git
* Machine Learning: tensorflow, scikit-learn, numpy and scipy
* Languages: Chinese (Native), Japanese (Fluent), Spanish (Intermediate), Arabic (Beginner)
* Translated the first two seasons of the Big Bang Theory into Chinese and promoted the show in China
* **1st** **Place** in Michigan Japanese Language Speech Contest (awarded round-trip tickets from US to Tokyo)
* Interests: Badminton, Table Tennis, Linguistics, Calligraphy, Typography, Manga