

Di (Flute) Xu

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EDUCATION

University of California, Los Angeles (UCLA)

03.2021-09.2026

Doctor of Philosophy in Computer Science, Research interest: Medical Imaging

- **Co-supervisor 1:** *Ke Sheng*, research in development of optimization, 3D modeling and navigation schemes and demonstrating the feasibility of creating and delivering highly non-coplanar 4pi plans on a new linac
- **Co-supervisor 2:** *Fabien Scalzo*, research directs to Stroke and traumatic brain injuries (TBI) using brain mapping of imaging and bio-signals (MR, CT, X-ray angiography, TCD, and ICP)

The University of Sydney (USYD), Honors Student

07.2017-07.2019

Master of Commerce in Business Analytics, Grade: D/HD (equivalent to A/A+ in the US grading system)

- **Relevant Courses:** Deep Learning, Machine Learning for Business, Computational Statistical Methods, Visual Data Analytics, Predictive Analytics, GIS and Spatial Data Analytics, Database Management Systems
- **Dissertation:** LSTM-assisted Evolutionary Self-expressive Subspace Clustering (**Awarded 2019 best student dissertation within USYD business analytics discipline**)

Hebei University of Technology, Honors Student

09.2013-07.2017

Bachelor of Engineering in Materials in Physics, GPA: 3.57/4.00

- **Relevant Courses:** Stochastic Processes, Game Theory, Mathematical Modeling, Quantum Mechanics
- **Dissertation:** Monte Carlo Simulation of the decomposition of MoS₂ material under various hyperthermia settings

University of California Los Angeles

09.2015-12.2015

Exchange Program, GPA: 4.00/4.00

- Only student selected for this exchange program out of 200+ applicants

PUBLICATIONS

* = equal contribution

Journal Papers

1. **Xu, D.**, Ma, T. M., Cao, M., Kishan, A., Scalzo, F., & Sheng, K. (n.d.). **Mask R-CNN Assisted 2.5D Object Detection Pipeline of 68Ga-PSMA-11 PET/CT-positive Metastatic Pelvic Lymph Node After Radical Prostatectomy**. Submitted to Journal of Nuclear Medicine.
2. **D. Xu***, S. Song*, G. Ozsoy, and F. Scalzo, **A Temporal Deep Learning Approach for Prediction of Tissue Fate in Acute Stroke Using Magnetic Resonance Imaging**
3. **D. Xu**, T. Long, and J. Gao, **LSTM-assisted Evolutionary Self-expressive Subspace Clustering**, IEEE Transactions on Neural Networks and Learning Systems, [arXiv:1910.08862](https://arxiv.org/abs/1910.08862)

Conference Papers

1. **D. Xu**, M. Fang, X. Hong, and J. Gao, **Sparse Kernel Logistic Machines Using Adaptive SBF Functions**
2. **D. Xu**, M. Fang, X. Hong, and J. Gao (2019), **Sparse Least Squares Low Rank Kernel Machines**, *Neural Information Processing*, 33. doi: 10.1007/978-3-030-36711-4_33, oral presentation, **best paper award**

ACHIEVEMENTS

Achievements:

- **Best Paper Award** for paper "**Sparse Least Squares Low Rank Kernel Machines**" in the **ICONIP 2019**
- Admitted to the 2019 Ph.D. Program of Business Analytics Discipline at USYD with full scholarship
- Sole outstanding student selected to the [research dissertation stream](#) of USYD 2019 Master of Commerce program
- Member, [Beta Gamma Sigma](#) (Business honor society for top 5% students of AACSB-accredited schools)

- Received [Dean's academic achievement letter](#) in 2018 2nd Semester (top 3 students only)
- Received **2019 best student dissertation** within USYD business analytics discipline for master dissertation research

RESEARCH EXPERIENCES

Detailed research results in <https://github.com/FluteXu>

Sheng Lab, University of California Los Angeles

03.2021-Present

Principle Investigator: Ke Sheng

- Conduct data preprocessing for the PSMA PET-CT raw DICOM data of prostate cancer patients; the work includes dealing with contour-mismatch data, pixel array and CT- related parameters extraction, and etc.
- Proposing a “2.5D attention-assisted detail object detection network” with inspiration of the 2-stage maskRCNN detection network to bound out the location of the prostate cancer metastasis on CT.

Mediastinum Group of AI Research Lab, Deepwise (Beijing) Co., LTD

07.2020-01.2021

Principle Investigator: Yizhou Yu | Group Leader: Cheng Wang

- Optimized MaskRCNN detection framework so as to effectively incorporate the 3D information of CT scans of patients with mediastinal diseases. The implementation framework is based on Facebook's Pytorch MaskRCNN-Benchmark and Detectron2 repositories. Specifically, the initial proposal was to send 9 slices of scan as input feature maps to the network, and then that was improved by incorporating the 3DCE and advanced 3DCE fusion methods, which significantly improve the average precision scores of our dataset.
- Explored the DeepLesion dataset released by NIH and applied the aforementioned MaskRCNN structures to it.
- Coded out the inspection script for doctors' data labelling accuracy. The program functioned in visualizing doctor labels' bounding box, labels' dice scores and its general accuracies.

AI in Imaging and Neuroscience Lab, University of California Los Angeles

07.2019-Present

Principle Investigator: Fabien Scalzo

- Processed the magnetic resonance imaging (MRI) of ischemic stroke patients to predict their tissue fate; sampled the training input as a $5 \times 5 \times t$ voxel 3-D “patch” combined with its corresponding arterial input function (AIF) from the pre-perfusion weighted imaging (PWI); The ground truth binary mask is derived from the post-fluid-attenuated inversion recovery (FLAIR) images.
- Developed novel multi-modality deep networks, such as Bi-CNN, Bi-Complex-LSTM and etc., to deconvolve the training information and further predict tissue fate.

Gao's Lab, The University of Sydney

11.2018-06.2019

Principle Investigator: Junbin Gao

- Proposed a framework to study evolutionary subspace clustering problem by taking advantage of the self-expressive characteristics in high-dimensional evolving dataset; implemented LSTM networks to extract the inherited temporal pattern; examined real-world motion segmentation and ocean salinity problems to demonstrate the effectiveness of the proposed algorithm
- Participated in proposing the novel least squares support vector machine (LSSVM) classifier using a new low rank kernel based on so-called robust radial basis function (R-RBF); introduced an iterative algorithm alternating between the closed form LSSVM solution and R-RBF gradient descent parameter estimation using MATLAB
- Summarized a learning framework for sparse kernel logistic regression (KLR); created a new optimization algorithm for optimizing kernel functions that align with various KLR using methods of gradient descent, Newton-Raphson, and coupled simulated annealing (CSA) in MATLAB

Discipline of Business Analytics, The University of Sydney

03.2018-07.2018

- Sorted and coded an algorithm for correction of multi-omics tumor sample mislabeling by using a novel semi-supervised adaptive sampling classifier and other elegant supervised state-of-art models in R
- Modeled a time series dataset of UK internet retail sales with a LSTM based RNN regressor using Python
- Completed the data-cleaning step of customer credit datasets using random forest and MICE methods with Python

- Coded an interface of data reading and writing between programming scripts and database with SQL and Python

Anderson School of Management, University of California Los Angeles

10.2015-12.2015

- Participated in optimizing the Black-Scholes model by introducing an investors' belief hypotheses into the Black-Scholes model; wrote the algorithm in C++
- Used C++ to Simulate various exotic option prices, including ladder options, butterfly options, etc., with MC methods

PROFESSIONAL SKILLS

Programming Languages: R, Python, C++, C, SQL, Linux, Git, VBA, LaTeX

Software Skills: MATLAB, Tableau, ArcGIS, PostgreSQL, Bloomberg, Wind, AutoCAD

Deep Learning Frameworks: Pytorch, Tensorflow

Certificates:

- Level II Candidate, [Chartered Financial Analyst \(CFA\)](#) (grade placed top 5% in global ranking)
- Certificate Holder, [C++ Programming for Financial Engineering](#) (joint program of Quantnet and Baruch MFE)

AWARDS AND SCHOLARSHIPS

Awards: First Prize - Tianjin Undergraduate Mathematical Contest

Scholarships:

- 2016 China National Scholarship (1%)
- 2014 2015 China National Endeavor Scholarship (5%)
- 2014 2015 2016 Hebei University of Technology Scholarship (20%)

PROFESSIONAL EXPERIENCES

PGC Education Co., LTD

01.2020-Present

Cofunder, Sydney, Australia

- Started up the Postgraduate Club (PGC) Co., LTD to provide educational courses for undergraduate and postgraduate students studied in Australia
- Built up the "AI University" course framework from scratch which deliver the rudimentary Python coding course, followed by Machine Learning Bootcamp and Advanced Deep Learning Bootcamp
- Proposed the DIY based consulting programs for US University applications which provide better information and efficiency for students studying in Australia but wanting to pursue higher education in USA

The University of Sydney

02.2019-06.2019

Teaching Assistant, Discipline of Business Analytics

- QUBS6810: Statistical Learning and Data Mining, Postgraduate unit of study, 2019S1
- QUBS6830: Financial Time Series and Forecasting, Postgraduate unit of study, 2019S1
- QUBS6840: Predictive Analytics, Postgraduate unit of study, 2019S1
- QUBS6850: Machine Learning for Business, Postgraduate unit of study, 2019S1

JZ Securities

12.2017-03.2018

Assistant Quantitative Derivatives Trader

- Conducted analysis of commodity seasonal pattern and derivatives pricing of the "Insurance Plus Options" project
- Optimized the OTC option pricing algorithm and added functions to auto-filter ST and small-cap stocks, calculate time-valued option volatilities, and perform conditional updates of option prices
- Built option dynamic hedging algorithm and calculated option volatilities with innovative volatility-cone model

Bacera Co. Pty Ltd

07.2017-10.2017

Assistant CFD Trader

- Pitched longs or shorts for various currency pairs on the ProTrader trading system based on customers' orders, with an average daily trading volume of about 40 million AUD dollars

- Conducted routine technical analysis of currency pairs' K-line charts and wrote summary reports for the fund manager

Qutke Technology (Beijing) Co., LTD

07.2016-12.2016

Assistant Data Analyst

- Helped code the Black-Litterman asset allocation package for generating interactive asset allocation reports
- Derived the mathematical portion of the Sector Rotation and Multi-Factors Stock Pitch strategy
- Completed the ETF automatic investment strategy by selecting a basket of mutual funds for specific customers

EXTRACURRICULAR ACTIVITIES

Trainee: Imperial College London Security Analysis and Asset Management Program ***2016***

Volunteer: South Africa IVHQ Computer Training Program ***2018***

Drummer of Rock & Roll Band: Comma Rock Band ***2013-2017***

LANGUAGE AND INTERESTS

Languages:

- Mandarin - Native
- English – Business Fluent

Interests:

- Deep Diving, Swimming, Kickboxing, Cycle, Marathon
- Jazz - Professional dance
- Drum set - 10+ years of experience