Xinyao(Alvin) Sun

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July 31, 2019

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Interests

- **Computer Vision, Human-Computer Interaction and Machine Learning:**
  - Deep Learning, Transfer Learning, Model Conversion
  - Signal Processing, Object Detection, Object Tracking, Face Verification, Action Recognition, Motion Analysis
  - Recommendation System, User Behavior Analysis
- **Blockchain Techniques:**
  - Smart Contracts & Blockchain Development, Security Enhancement
  - Decentralized Machine Learning

Education

- **University of Alberta** — Edmonton, AB
  Ph.D. in Computing Science — *Sept. 2017 - Present*
- **University of Alberta** — Edmonton, AB
  M.S. Computing Science, Specialization with Multimedia — *Sept. 2015 - Apr. 2017*
- **University of Alberta** — Edmonton, AB
  B.Sc. Science, Specialization in Computing Science — *Sept. 2010 - Dec. 2015*

Research and Work Experience

- **3vGeomatics Inc** — Edmonton, AB
  MITACS Accelerate Research Intern — *July. 2017 - Present*
  Funded by Consortium of Aerospace Research and Innovation in Canada (CARIC).
  - Large scale motion mapping of ground displacement with InSAR images
  - Use Deep Learning technique to denoise InSAR noisy images and estimate coherence index
  - Develop a evolution strategy based algorithm to estimate ground motion rate and DEM height error
  - Woks are released on the news: TheStar, Journal of Edmonton, GatewayOnline, University of Alberta website.
- **Bi.Link Inc & Bi9.cn Inc** — Shanghai, China
  Co-founder — *April. 2018 - Present*
  - Bi9.cn helps customers to earn more than $1.5 million profit in 2018
  - Built a Digital asset management platform, and contributed to hedge fund strategies by analyzing trading behaviors and environments of multiple Digital Currency Marketplaces
  - Built a decentralized digital asset lending platform and hosted on EOS and Ethereum public chains

- Digital Assets used as a collateral for loans are stored in a public Ethereum and EOS blockchain to obtain high network security with the use of a non-custodian depository smart contract.
- Toke charge of developing 1) all business logic of EOS smart contracts 2) corresponding front-end APIs for web apps integration and interaction with smart contracts on EOS public chain.

- **Boardee Inc** Edmonton, AB
  Co-founder *May. 2016 - Sept. 2017*
  - One of three finalists in TELUC ICT streams in TEC of Edmonton competition 2017
  - Developed and co-designed a front-end cross-platform mobile applications.
  - Co-developed a back-end system for fetching location-awarded social media contents from the Internet.
  - Explored content-based recommendation and user notification strategies based on user's preference via deep recurrent neural networks.

- **TCL Research America, Silicon Valley** San Jose, CA
  Research Engineer Intern *May. 2016 - Expected Jan. 2017*
  - Developed and led team for using the Drone as inter-mediator to enhance human to human communication.
  - Implemented an Android app for tracking human face to control the Parrot Bebop Drone to follow the detected person.
  - Developed a system for human body detection, tracking, and human face detection, verification via deep convolutional neural networks, and built an autopilot framework for UAV devices.
  - First inventor of three patents and co-inventor of one patent on related works.

- **City of Edmonton, IT Department** Edmonton, AB
  Course Project under Dr. Lihang Ying and Dr. Irene Cheng *Jan. 2016 - Apr. 2016*
  - Developed and led the team for feature matching based residential area recommendation system.
  - Designed the three-layers system, developed mobile app and web app, co-developed the back-end business logic service.

- **Orbital Software Solutions Inc** Edmonton, AB
  Research Assistant under Dr. Irene Cheng *Sep. 2015 - Mar. 2016*
  Funde by NSERC
  - Developed a sensor-based Cloud Computing Interface (CCI) - for motion analysis as a performance metric and education Tool.
  - Developed a Multi-Leap Motion Sensor System via Linux Container (LXC) technique, and used machine learning algorithm for motion data fusion to overcome the single vision based sensor's occlusion issue.

- **Surgical Simulation Research Lab, University of Alberta** Edmonton, AB
  Research Assistant under Dr. Bin Zheng and Dr. Anup Basu *Jan. 2015 - Apr. 2015*
  - Developed a Smart Sensor-based Motion Detection system for hand movement training in open surgery by using a statistical model.

- **Multimedia Reserach Center, University of Alberta** Edmonton, AB
  Research Assistant under Dr. Irene Cheng and Dr. Anup Basu *Jan. 2015 - Apr. 2015*
  - Developed a Segmentation Quality Assessment mode for Ground Truth Delineation via medical Image Segmentation based on Local Consistency and Distribution Map Analysis.

- **ShunSoft Ltd** Shanghai, China
  Freelancer, Outsource Developer *Sept. 2014 - Jun. 2015*

- Developed the iOS version of ShunSoft's stock and futures trading app, which allows users to do transactions, and change the risk management settings of their accounts through iOS devices.
- Designed and co-develop ShunSoft's back-end dashboard that allows multiple users to make detailed stock auto-transaction and risk management settings simultaneously, which focused on the requirements of security, availability and stability.

- **Game Cloud Ltd** Edmonton, AB
  Co-founder *Jan. 2014 - Sept. 2014*
  - Co-founded a mobile game studio as one of core programmer for creating interesting casual and arcade mobile phone games and reached 500K downloads.

Publications

- **X. Sun**, A. Zimmer, N. Kottayil, S. Mukherjee, I. Cheng, "DeepInSAR: A Deep Learning Framework for SAR Interferometric Phase Restoration and Coherence Estimation", Journal Submission. 2019
- S. Mukherjee, N. Kottayil, **X. Sun**, I. Cheng, "CNN-Based Real-Time Parameter Tuning for Optimizing Denoising Filter Performance", International Conference on Image Analysis and Recognition (ICIAR) 2019
- **X. Sun**, N. Kottayil, S. Mukherjee, I. Cheng, "Adversarial Training for Dual-stage Image Denoising Enhanced with Feature Matching", International Conference on Smart Multimedia (ICSM). 2018
- S. Mukherjee, A. Zimmer, N. Kottayil, **X. Sun**, P Ghuman, I. Cheng, "CNN-Based InSAR Denoising and Coherence Metric" IEEE SENSORS. 2018
- N. Kottayil, A. Zimmer, S. Mukherjee, **X. Sun**, P Ghuman, I. Cheng, "Accurate Pixel-Based Noise Estimation for InSAR Interferograms" IEEE SENSORS. 2018
- **X. Sun**, A. Basu, I. Cheng, "Multi-Sensor Motion Fusion Using Deep Neural Network Learning", International Journal of Multimedia Data Engineering and Management (IJMDEM). 2017
- **X. Sun**, S. Byrns, I. Cheng, B Zheng and A. Basu, "Smart Sensor-Based Motion Detection System for Objective Measurement of Hand Movements in Open Surgery", Journal of Medical System, 41.2 (2017): 24.
- **X. Sun**, I. Cheng, A. Basu, "Spatio-Temporal Optimized Multi-Sensor Motion Fusion", IEEE International Symposium on Multimedia (ISM), 2016.
- A.-C. Furtado, **X. Sun**, A. Basu and I. Cheng, "Optimized Per-Joint Compression of Hand Motion Data", IEEE System Man and Cybernetics (SMC), 2016.
- I. Cheng, **X. Sun**, N. Alsufyani, Z. Xiong, P. Major and A. Basu, "Ground Truth Delineation for Medical Image Segmentation based on "Local Consistency and Distribution Map Analysis," IEEE Engineering in Medicine and Biology Conference (EMBC), 2015.

Patents

- **X. Sun**, X.L. Liao, X. Ren and H. Wang. "System and method for vision-based flight self-stabilization by deep gated recurrent Q-networks". Grant 2019 US Patent No.10241520 B2
- X.L. Liao, **X. Sun**, X. Ren and H. Wang. "Method and device for Quasi-Gibbs structure sampling by deep permutation for person identity inference". Grant 2019 US Patent No.10339408 B2
- **X. Sun**, X.L. Liao, X. Ren and H. Wang. "System and method for enhancing target tracking via detector and tracker fusion for unmanned aerial vehicles". Grant 2018, US Patent No.10140719 B2
- **X. Sun**, X.L. Liao, X. Ren and H. Wang. "Face detection, identification, and tracking system for robotic devices". Grant 2018, US Patent No.10068135 B2

Awards

- `Awarded a University of Alberta Doctoral Recruitment Scholarship`
- `Awarded a University of Alberta Academic Excellence Scholarship`
- `Awarded an International Student Scholarship (Bridging Program)`
- `Awarded Golden Key International Honor Society Membership`

Computer Skills

- **Languages:** C, C++, Python, Obj, Obj-C, , HTML, Javascript, CSS, Matlab, Java, Fortran
- **Tools:** Linux Shell, GNU Maker, Vim, Visual Studio, Eclipse, Xcode, Qt-Creater, Tensorflow, pyTorch, Caffe, OpenCV, dlib, Qt, Node.js ,Ionic, EOS, Apache Cordova, Cocoa Touch, Docker, LXC.
- **OS:**Linux, Mac OS and Windows.