Khoi-Nguyen C. Mac

Ph.D. Candidate
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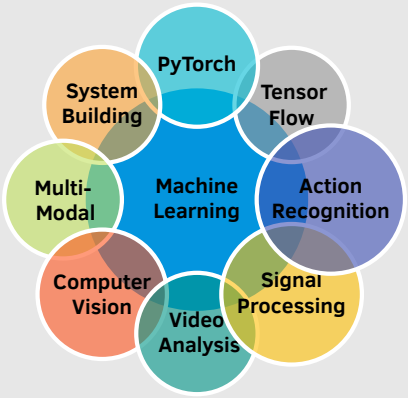
Technical Skills

Overview



Programming

Python

MATLAB • Bash • LaTeX

C • C++ • Java

Education

Doctor of Philosophy (GPA: 3.78)
Electrical and Computer Engineering
University of Illinois Urbana-Champaign
2016 - Present | Champaign IL, US

Master of Engineering (GPA: 3.99)
Multimedia Communication Systems
Eurecom Institute, Télécom ParisTech
2013 - 2015 | Sophia Antipolis, France

Bachelor of Science (GPA: 3.95)
Computer Science
University of Science, VNU
2008 - 2012 | Ho Chi Minh, Vietnam

Experience

May 2020 - Aug 2020 — **Facebook Reality Labs** — Research Intern
Adaptive Spatiotemporal Sampling for Action Recognition
- **Description:** *Investigated* the spatial-temporal relation in videos and conduct sparse sampling on both of these domains; *Proposed* an action recognition framework to improve computational efficiency by adaptively skipping frames and regions predicted through the hallucination of future attention.
- **Mentor:** Dr. Minh Vo

May 2019 - Aug 2019 — **Texas Instruments** — System Engineering Intern
Ego-Mobile Object Detection and Tracking using Camera and Radar
- **Description:** *Developed* algorithms for object detection and tracking in ego-mobile scenarios by fusing camera (object detection) and radar sensors (range information); *Leveraged* open source frameworks for rapid prototyping and performance evaluation.
- **Supervisor:** Dr. JuneChul Roh **Manager:** Dr. Darnell Moore

May 2018 - Aug 2018 — **IBM Watson Research Center** — Research Intern
Large Scaled Mixed-Band Deep Neural Network Acoustic Modeling for Automatic Speech Recognition
- **Description:** *Investigated* mixed-bandwidth (MB) deep neural network acoustic modeling for ASR with large-scale training data; *Proposed* a CNN-based discriminatively trained bandwidth extension (BWE) model with a VGG architecture to map the NB to WB speech.
- Accepted as an *oral presentation* at InterSpeech 2019.
- **Mentor:** Dr. Xiaodong Cui **Manager:** Dr. Michael Picheny

May 2017 - Aug 2017 — **IBM Watson Research Center** — Research Intern
Auto-Curation of Sports Highlights for Wimbledon and US Open 2017
- **Description:** *Proposed* a novel approach for auto-curating sports highlights; *Created* a real-world system for the editorial aid of tennis highlight reels, based on players' reactions, players' expressions, and spectators.
- Demonstrated at 2017 Wimbledon and US Open tournaments.
- **Mentor:** Dr. Dhiraj Joshi **Manager:** Dr. Rogerio S. Feris.

Jan 2016 - Present — **University of Illinois at Urbana-Champaign** — Research Assistant
Multi-modal video analysis, action recognition and detection
- Collaborated with C3SR center (IBM), Creative Experiential Learning Advisor (CELA) project (2016 - 2020).
- **Advisor:** Prof. Minh N. Do

Awards and Honors

- Oral presentation at ICCV 2019.
- Oral presentation at InterSpeech 2019.
- Auto-curation systems for Wimbledon and US Open official highlights 2017.
- Eiffel scholarship laureate by French Government (2013-2015)
- Rank 1 of APCS 2008 (Bachelor program) in 2010-2011 and 2011-2012.
- AmCham Scholarship 2011.

Courses

- ECE544 - *Pattern Recognition*, Prof. Alexander Schwing, UIUC (2017)
- ECE490 - *Introduction to Optimization*, Prof. Srikant Rayadurgam, UIUC (2017)
- ECE534 - *Random Processes*, Prof. Olgica Milenkovic, UIUC (2017)
- ECE551 - *Digital Signal Processing II*, Prof. Minh N. Do, UIUC (2016)
- ECE513 - *Vector Space Signal Processing*, Prof. Yoram Bresler, UIUC (2016)
- ECE549 - *Computer Vision*, Prof. Svetlana Lazebnik, UIUC (2016)

Research

Jan 2016 - Present
Doctor of Philosophy — University of Illinois at Urbana-Champaign
Thesis: Learning Efficient Temporal Information in Deep Networks: from the Viewpoints of Applications and Modeling
- **Past Research:** Learning Motion in Feature Space
  - **Description:** *Proposed* a deep learning model to jointly learn both spatial and temporal information without using optical flow; *Proposed* the novel locally-consistent deformable convolution (LCDC), which enforced a local coherency constraint on the receptive fields, to model motion on feature space.
  - Accepted as an *oral presentation* at ICCV 2019.
- The research assistant-ship is supported by C3SR center (IBM)
- **Advisor:** Prof. Minh N. Do **Director:** Dr. Jinjun Xiong.

Sep 2013 - Sep 2015
Master of Engineering — Eurecom Institute, Télécom ParisTech
Thesis: Multi-modal SLAM System for Indoor Environment
- **Description:** *Proposed* an SLAM system for indoor environment using visual, depth, and IMU reading; *Robust* against loop closure and human natural walking gesture, even when visual features are temporarily lost.
- The thesis was from my internship at UIUC (Mar - Aug 2015)
- **Advisor:** Prof. Minh N. Do.

Sep 2008 - Sep 2012
Bachelor of Science — University of Science, VNU
Thesis: Natural User Interface for Smart Environment
- **Description:** *Proposed* a system to control presentations in a natural way using body gestures and vocal commands; *Fused* three modules: gesture recognition with Kinect 3D skeleton, key concepts detection by context analysis from speech, and hand gesture recognition from smart phone sensors.
- **Advisor:** Prof. Minh-Triet Tran

Selected Publications

Patents

- **KNC Mac**, RA Yeh, D Joshi, MN Do, RS Feris, J Xiong. "Action Detection by Exploiting Motion in Receptive Fields", filed in May 2018.

Conferences

- **KNC Mac**, D Joshi, RA Yeh, J Xiong, RS Feris, MN Do. "Learning Motion in Feature Space: Locally-Consistent Deformable Convolution Networks for Fine-Grained Action Detection", *ICCV*, Oct 2019, **Oral**.
- **KNC Mac**, X Cui, W Zhang, M Picheny. "Large-Scale Mixed-Bandwidth Deep Neural Network Acoustic Modeling for Automatic Speech Recognition", *Interspeech*, Sep 2019, **Oral**.
- HA Le, **KNC Mac**, TA Pham, VT Nguyen, MT Tran. "Multimodal Smart Interactive Presentation System", *HCI International*, Jul 2013.
- HA Le, **KNC Mac**, TA Pham, MT Tran. "Realtime Pointing Gesture Recognition and Applications in Multi-User Interaction, *ACIIDS*, Mar 2013.
- HA Le, **KNC Mac**, TA Pham, VT Nguyen, MT Tran, AD Duong. "SIM-Smart Interactive Map with Pointing Gestures", *IHMSC*, Aug 2012.

Journals

- M Merler, **KNC Mac**, D Joshi, QB Nguyen, S Hammer, J Kent, J Xiong, MN Do, JR Smith, RS Feris. "Automatic Curation of Sports Highlights using Multimodal Excitement Features", *IEEE Transactions on Multimedia*, Oct 2018.

Workshops

- M Merler, D Joshi, **KNC Mac**, QB Nguyen, J Kent, S Hammer, J Xiong, MN Do, JR Smith, RS Feris. "The Excitement of Sports: Automatic Highlights Using Audio/Visual Cues", *CVPR Workshops*, August 2018.

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