

## CAT P. LE

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### EDUCATION

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#### Duke University

Durham, NC

Ph.D., Electrical and Computer Engineering

Expected May 2023

Research: *Machine Learning, Computer Vision*

GDP: 3.94

Advisor: Dr. Vahid Tarokh

#### California Institute of Technology

Pasadena, CA

M.S., Electrical Engineering

June 2017

GDP: 4.00

Advisor: Dr. Babak Hassibi

#### Rutgers University – New Brunswick

New Brunswick, NJ

B.S., Electrical and Computer Engineering

May 2016

GDP: 4.00

List honors: *Summa Cum Laude, Matthew Leydt Award, John B. Smith Award, Outstanding Engineering Scholar, E. M. Toomey Scholarship, Tau Beta Pi, Eta Kappa Nu*

### PROFESSIONAL EXPERIENCE

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#### Amazon – Alexa Natural Understanding

Arlington, VA

*Research Scientist Intern*

June 2022 – September 2022

- Analyze open-domain dialogs via sentiment analysis, response relevance, response specificity, and text classification.
- Extract various feature vectors (e.g., sentiment, response, etc.) from open-domain dialogs and utilize them for customer's rating prediction.
- Develop a novel open-domain dialog evaluation system, based on BERT, LSTM.
- The model is trained to predict the ratings from the customers and experts.
- Apply causal inference in the open-domain dialog evaluation system to further improve the flexibility and the performance of the model.

#### Motorola Solutions

Dallas, TX

*Software Engineer*

June 2017 – August 2018

- Design printed circuit board (PCB) and other hardware for the license plate recognition and facial recognition cameras.
- Develop Camera Systems Synchronization with LED Strobing to reduce the energy consumption and help improve the detection performance for the cameras.
- Develop a novel Optical Character Recognition (OCR) Algorithm to further improve the performance of license plate recognition camera.

## RESEARCH EXPERIENCE

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### Duke University

Durham, NC

*Graduate Research Assistant*

August 2018 – Present

- Define task affinity based on Fisher Information matrices and maximum bipartite matching algorithm.
- The task affinity indicates the complexity of transferring the knowledge of a task to another. It is non-commutative and invariant to label permutation.
- The applications of the task affinity include neural architecture search, transfer learning, few-shot learning, multi-task learning, etc.

### California Institute of Technology

Pasadena, CA

*Graduate Research Assistant*

September 2016 – June 2017

- The JPL Sleeve is used to read the signal from 20 muscles on the human's hand and map it into alphabet.
- Real-time musical note detector (FPGA, FFT) that helps users learn music by ear and play it flawlessly.

### Rutgers University

New Brunswick, NJ

*Undergraduate Research Assistant*

August 2015 – May 2016

- Researched on Radio Access Network under REU Funding Program of National Science Foundation (NSF).
- Simulated three OpenAirInterface base stations (USRP B210) allocate their resources for users' demand.
- Analyzed the performance of data transmitted between base station (eNB) and users (UEs).

### WINLAB

North Brunswick, NJ

*Undergraduate Research Assistant*

May 2015 – August 2015

- Research on Wi-Fi, LTE, and LTE in Unlicensed Spectrum (LTE-U).
- Simulated the LTE's eNB/UE by USRP B210 in ORBIT Lab using OMF, OpenAirInterface repositories.
- Analyzed the transmitted data based on Spectrum plot, Waterfall plot, Constellation plot for varying bandwidths.

## TEACHING EXPERIENCE

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### Duke University

Durham, NC

- ECE 590 - Introduction to Deep Learning
- ECE 681 - Pattern Classification and Recognition Technology

### California Institute of Technology

Pasadena, CA

- APh/EE 9 - Solid-State Electronics for Integrated Circuits

### Rutgers University

New Brunswick, NJ

- 14:332:346 - Digital Signal Processing

## PUBLICATIONS

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- C. P. Le, L. Dai, M. Johnston, Y. Liu, M. Walker, R. Ghanadan, “Improving Open-Domain Dialog Evaluation with a Counterfactual LSTM,” in Diversity in Dialogue Systems, IWSDSD, 2023.
- Aloui, A., Dong, J., Le, C. P., and Tarokh, V., “Causal Knowledge Transfer from Task Affinity,” submitted to ICML, 2023.
- C. P. Le, J. Dong, M. Soltani, and V. Tarokh, “Task affinity with maximum bipartite matching in few-shot learning,” in International Conference on Learning Representations, 2022.
- Le, C.P., Soltani, M., Dong, J., & Tarokh, V. (2021). Fisher Task Distance and Its Applications in Neural Architecture Search and Transfer Learning. IEEE Access 2022.
- Le, C. P., Soltani, M., Ravier, R., & Tarokh, V. (2021, June). Task-aware neural architecture search. In ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 4090-4094). IEEE.
- Le, C. P., Soltani, M., Ravier, R., & Tarokh, V. (2021). Neural Architecture Search From Task Similarity Measure. arXiv preprint arXiv:2103.00241.
- Le, C. P., Zhou, Y., Ding, J., & Tarokh, V. (2020, May). Supervised Encoding for Discrete Representation Learning. In ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 3447-3451). IEEE.

## HONORS & AWARDS

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Nikola Tesla Scholar (Columbia University)	2016
Matthew Leydt Award (Rutgers University)	2016
John B. Smith Award (Rutgers University)	2016
Outstanding Engineering Scholar (Rutgers University)	2016
E. M. Toomey Scholarship (Rutgers University)	2015

## PROFESSIONAL AFFILIATIONS AND HONOR SOCIETIES

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The Institute of Electrical and Electronics Engineers (IEEE)	2018 - Present
IEEE – Signal Processing Society	2020 - Present
Tau Beta Pi	2015 – Present
Eta Kappa Nu	2015 – Present
Sigma Alpha Pi	2016 – Present

## SKILLS

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- Python (Proficient) – Numpy, Scipy, Pandas, Beautiful Soap, Matplotlib, Seaborn, Plotly, Scikit-learn, Tensorflow, Keras
- Matlab (Proficient), C/C++ (Familiar), OpenCV, LabVIEW
- Operating System: Linux, Windows, MacOS
- Other: Latex, Git, Excel, Word, PowerPoint

## REFERENCES

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- Prof. Vahid Tarokh ([vahid.tarokh@duke.edu](mailto:vahid.tarokh@duke.edu))  
Professor, Duke University
- Prof. Babak Hassibi ([hassibi@caltech.edu](mailto:hassibi@caltech.edu))  
Professor, California Institute of Technology
- Prof. Yicheng Lu ([ylu@ece.rutgers.edu](mailto:ylu@ece.rutgers.edu))  
Distinguished Professor, Rutgers University