

# Bo-Ru (Roy) Lu

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## Education

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- University of Washington Seattle, WA  
Ph.D. in Electrical & Computer Engineering. Overall GPA: 3.9/4.0. 2018 - present  
Advisor: Mari Ostendorf.
- National Taiwan University Taiwan  
M.S. in Communication Engineering. Overall GPA: 4.0/4.0. 2016 - 2018  
Advisors: Lin-Shan Lee and Hung-Yi Lee.
- National Taiwan University Taiwan  
B.S. in Electrical Engineering. Overall GPA: 3.7/4.0, CS-relevant GPA: 4.0/4.0. 2012 - 2016

## Research Experiences

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- UW NLP Research Assistant Fall 2018 - present
  - Advisor and collaborators: Mari Ostendorf, Noah A. Smith and Hao Cheng.
  - Developed a new configuration for encoder-decoder transformer models to boost the task performance and increase the **training and inference efficiency** on three decomposable tasks (e.g. dialogue state tracking, medical summarization, medical question answering).
  - Built a **collaborative human-language model framework** to synthesize data, enhancing the performance of fine-tuned T5 models for realistic call center applications.
  - Developed an **unsupervised learning algorithm** that automatically extracts **dialogue structures** to improve transformer performance and summarize call center calls.
  - Built a multi-task model of **knowledge identification in document-grounded conversations** and achieved state-of-the-art results in two recent datasets.
- Amazon Applied Scientist Intern Spring & Summer 2022
  - Mentors: Yang Liu and Dilek Hakkani-Tür.
  - Worked on **knowledge-grounded response generation for information-seeking dialogues**. Integrated reranking loss function into a response generation model to improve the inference efficiency.
- Google Research Intern Summer 2021
  - Mentors: Joshua Ainslie and Santiago Ontañón.
  - Worked on **multimodal representation learning** via a joint vision-language transformer that integrates 2-D image positional encoding to account for the relatively spatial relationships between pixel patches in images. [code]
- Microsoft Research Intern Summer 2020
  - Mentors: Xiaofeng Zhu and Pengchuan Zhang.
  - Worked on weakly supervised user question discovery on private customer service data via multiple instance learning.
- Apple Machine Learning Intern Spring 2018
  - Mentors: Longkai Zhang and Xin Wang.
  - Developed a sequence-to-sequence model for Chinese keyboard input (QuickPath) introduced in iOS 13.
- NTU Research Assistant Spring 2015 - Summer 2018
  - Advisors and collaborator: Lin-Shan Lee, Hung-Yi Lee and Yun-Nung (Vivian) Chen.
  - Sequence-to-sequence models for text and spoken document summarization.

## Publications & Preprints

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- Encode Once and Decode in Parallel: Efficient Transformer Decoding  
Bo-Ru Lu, Nikita Haduong, Chien-Yu Lin, Hao Cheng, Noah A. Smith, Mari Ostendorf. Preprint, 2024.
- Does Collaborative Human-LM Dialogue Generation Help Information Extraction from Human Dialogues?  
Bo-Ru Lu\*, Nikita Haduong\*, Chia-Hsuan Lee, Zeqiu Wu, Hao Cheng, Paul Koester, Jean Utke, Tao Yu, Noah A. Smith, Mari Ostendorf. \*Equal contribution. Preprint, 2023.
- Unsupervised Learning of Hierarchical Conversation Structure  
Bo-Ru Lu, Yushi Hu, Hao Cheng, Noah A. Smith, Mari Ostendorf. EMNLP Findings, 2022.
- DIALKI: Knowledge Identification in Conversational Systems through Dialogue-Document Contextualization.  
Zeqiu Wu\*, Bo-Ru Lu\*, Hannaneh Hajishirzi, Mari Ostendorf. \*Equal contribution. EMNLP 2021.
- A Multi-Passage Knowledge Selector for Information-Seeking Dialogues  
Zeqiu Wu\*, Bo-Ru Lu\*, Hannaneh Hajishirzi, Mari Ostendorf. \*Equal contribution. DialDoc@ACL, 2021.
- Order-Preserving Abstractive Summarization for Spoken Content Based on Connectionist Temporal Classification  
Bo-Ru Lu, Frank Shyu, Yun-Nung Chen, Hung-Yi Lee, Lin-Shan Lee. Interspeech, 2017.

## Awards and Honors

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- Ranked the 1st place out of 23 teams in the shared task 1 at 1st DialDoc workshop, ACL-IJCNLP 2021. 2021
- 2018 Foxconn Techonology Award, Foxconn Education Foundation. 2019
- Government Scholarship for Studying Abroad, Ministry of Education, Taiwan. 2018
- Long-Term Fellowship for Cultivating Elite Students, Hsing Tian Kong, Taiwan. 2017 - 2022
  - Fellowship to support elite students in Taiwan with the acceptance rate of 0.1%.
- Advanced Speech Technologies Scholarship, National Taiwan University, Taiwan. 2017
  - Recognizes students with excellent academic performance in speech processing (3 recipients in the year).
- International Speech and Communication Association Student Travel Grants, ISCA. 2017
- NTU Electrical Engineering 1960 Alumni Scholarship, National Taiwan University, Taiwan. 2015
  - Recognizes undergraduates in EECS with excellent academic performance (2 recipients a year).
- Dean's list. 2013

## Teaching Experiences

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- Intelligent Conversational Bot, NTU CSIE. Instructor: Yun-Nung (Vivian) Chen. Spring 2017
- Machine Learning NTU EE. Instructor: Hung-Yi Lee. Fall 2016
  - Lead TA: led the team of 13 TAs and tutored 278 students in the course.
- Applied Deep Learning, NTU CSIE. Instructor: Yun-Nung (Vivian) Chen. Fall 2016

## Services

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- Program Committee (Reviewer)  
ACL ARR 2023-present, ICASSP 2023-2024, AAAI 2023-2024,

## Skills

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- **Languages:** Mandarin (native), Taiwanese (native), English (professional working proficiency).
- **Programming Languages:** Python, Shell Script, Javascript, C/C++.
- **Libraries:** PyTorch, TensorFlow, Hugging Face, Scikit-learn, Numpy, Pandas.
- **Tools:** Git, Vim, Slurm, HTCondor,  $\text{\LaTeX}$ , Google Cloud, Azure, AWS.

Last updated: April, 2024