

# XUE Boyang

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Research Interest: Language Modelling, Speech Recognition, Machine Learning.

## Education

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Pursing Ph.D. in The Chinese University of Hong Kong (CUHK). Aug.2021 - Present

B.Eng. in Huazhong University of Science and Technology (HUST). Sep.2016 – Jun.2020

## Publications

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### First Author:

Bayesian Neural Network Language Models for Speech Recognition. in *IEEE/ACM TASLP*, 2022.

Bayesian Transformer Language Models for Speech Recognition. in *IEEE ICASSP*, 2021.

Deep Learning based Patient-Specific Fetal Heart Rate Detection System on FECG. *Chinese Patent*, 2020.

Heads-up Limit Hold'em Texas Poker based on CFR with Advanced Abstractions. *Bachelor Thesis*, 2020.

## Experiences

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**Sep.2020 – Present:** Research Assistant and Ph.D candidate in CUHK supervised by **Prof. Xunying LIU**.

- Applying variational inference based Bayesian neural networks on Transformer language models (LMs) to improve the model generalization. Improve the recognition accuracy on a cross domain LM adaptation task on the conversational corpus to a low-resource Alzheimer's speech corpus. Papers have been published on the speech top conference *ICASSP*.

- Systematically applying a variational inference based Bayesian framework including Bayesian Neural Networks, Gaussian Process and Variational Neural Networks to model uncertainty in conventional LSTM-RNN and Transformer language models to address the overfitting issue given limited training set. NAS techniques that efficiently select the optimal network internal components to be Bayesian learned and a minimal number of Monte Carlo parameter samples were used to reduce computation cost. A signal-to-noise ratio computed over the variational Gaussian distributions was also used to measure the parameter uncertainty. One manuscript has been published on speech top journal *TASLP*.

- Applying cross-utterance language models on lattice rescoring, a cross-utterance history clustering based lattice rescoring method and GNNs based method on lattices to extract cross-utterance representations were proposed to reduce WERs. The related paper is under preparation.

**Sep.2019 - June.2020:** Research Intern in Intelligent Control Lab, HUST supervised by **Prof. Ye YUAN**.

- Principal Investigator of a Fetal Heartbeat Detection Project (co-operated with Tongji Hospital). Propose a deep-learning based framework to achieve patient-specific diagnosis on FECG and created a Chinese patent.

**Sep.2018 - Aug.2019:** Team Leader in Robotic Team, HUST supervised by **Prof. Dingxin HE**.

- Designed Balanced cars, Tracking cars for Beacons, Energy-efficient cars et al. and joined the *NXP Cup National University Intelligent Car Race* twice. Responsible for the programming and algorithm design for signal processing, motion control, wireless charging and embedding development.

## Awards & Honors

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- ◆ National First Prize in *14th NXP Cup National University Intelligent Car Race* (Top 1%, 2019).

- ◆ Excellent Graduate Prize (Top 10%, 2020 in HUST), University Scholarship (Top 10%, 2018 in HUST).

## Skills

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- ◆ Programming and Development: C, Python, MATLAB, Linux Shell, Latex, PyTorch, Kaldi et al.

- ◆ Excellent communication, leadership, team spirit and English skills (IELTS – L:6.0, R:7.5, W:7.0, S:5.5, Overall: 6.5). Writing related forum and papers in [Zhihu](https://www.zhihu.com) and PaperWeely. Responsible for a machine learning open source project in Datawhale.

- ◆ Always joined the voluntary activities, skilled in piano, and tennis, hiking et al.