

# XUE Boyang

Address: Jintai District, Baoji City, Shaanxi Province, 721000 P.R.China;

Email: [byxue@se.cuhk.edu.hk](mailto:byxue@se.cuhk.edu.hk); [1276180641@qq.com](mailto:1276180641@qq.com). WeChat: NightWalzer; QQ: 1276180641

Mobile: (86) 189 9270 5010; (852) 6024 3345. Personal Website: <https://amourwaltz.github.io>

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 -

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

## Publications

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### First Author:

Bayesian Transformer Language Models for Speech Recognition. *ICASSP 2021*.

Bayesian Neural Network Language Models for Speech Recognition. In submission to *TASLP*.

*Chinese Patent*: Patient-specific Fetal Heartbeat Rate Detection Model Based on Deep Learning.

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

## Experiences

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

Project 1: 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 and poor generalization issues 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. Two papers are published on speech top conference *ICASSP* (accepted) and top journal *TASLP* (in submission).

Project 2: 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*.
- Provincial Prize in Embedding Development competitions and Mathematical Modelling contests.
- Excellent Graduate Prize, Excellent Leader Prize, Innovation Awards.

## Skills

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- Excellent mathematical, data structure and machine learning basis, C++, Python programming skills.
- Mastery in Linux Operation, PyTorch for deep learning development and Kaldi for speech development.
- Excellent communication, leadership, team spirit and English skills. 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.