

## Academic Background

September 2018 **Harbin Institute of Technology, Weihai.**

– July 2022 B.Eng. (Excepted) in Software Engineering

**Rank: 1<sup>st</sup>/181. GPA: 3.96/4.00.**

**TOEFL iBT:** 103 Listening(28), Speaking(22), Reading(26), Writing(27)

**Course Highlight:** Foundation of Machine Learning(full mark, course of NTU), Artificial Intelligence(97), Algorithm(99), Discrete Mathematics(94), Linear Algebra(95)

August 2020 **Harvard University/Massachusetts Institute of Technology.**

Visiting Student in program *Artificial Intelligence and Robotics*

## Selected Honors and Awards

During my undergraduate studies in the past two years, I have won more than 15 awards.

October 2020 **First Prize**, *Contemporary Undergraduate Mathematical Contest in Modeling.*

April 2020 **Outstanding League Cadres**, *Harbin Institute of Technology.*

January 2020 **Second Prize**, *ACM Algorithm Competition, Harbin Institute of Technology.*

December 2019 **Second Prize**, *The Chinese Mathematics Competitions.*

December 2019 **First Prize**, *The Principal Cup, Harbin Institute of Technology.*

October 2019 **National Scholarship**, *issued by Ministry of Education.*

*Top 1 of 200+ students (<0.5%).* Highest honor & scholarship in China for academic achievements, social activities and volunteering work.

July 2019 **First Prize**, *The People's Scholarship in China, issued by Ministry of Education.*

## Working Research Manuscripts

M01 **Embedding Visualization Interpretability**, *to be submitted soon.*

Mingjie Li, **Shaobo Wang**, Quanshi Zhang.

- Constructed a quantifiable visualization of the evolution of sample embedding states from random distribution to clusters to study how they converge.
- Quantified the importance for each kernel in image sample and channel and obtained corresponding region embeddings.
- Analyzed the sample and region embedding shift behavior during training both temporally and spatially to provide guidelines for classification-based learning.

M02 **The Sound of Pixels++**, *ongoing independent research.*

**Shaobo Wang**, Hang Zhao.

- Given a mute video and a click at some region in the video frame, generating plausible sound of the target object in the specific region of the mute video based on pre-learned knowledge or silence of the region without a deterministic object.

M03 **Insights of Loss Jump**, *ongoing independent research.*

**Shaobo Wang**, Dongrui Liu and Quanshi Zhang.

- Aiming to provide the Loss Jump explanation from *Shapley Value*-based Analysis.
- Proposed to investigate the knowledge representation variation before and after the jump.

## R01 Disease Prediction of Dengue Incidence in Brasilia.

**Shaobo Wang**, with a Tsinghua Team led by Dr.Zhichao Li.

- Predicted the incidence based on LSTM with meteorological information and incidence data in the 33 district of Brasilia independently.
- Proposed a more accurate model based on Conv-LSTM with the extracted spatial information.

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## Research Experience

February 2021 **Tsinghua University**, *Institute for Interdisciplinary Information Sciences*.

till now *Research Intern*, under supervision of [Prof.Hang Zhao](#).

- Surveyed self-supervised learning and working on a new idea in multimodal learning [M02].

July 2020 **Shanghai Jiaotong University**, *John Hopcroft Center for Computer Science*.

till now *Research Intern*, under supervision of [Prof.Quanshi Zhang](#).

- Worked on evolutionary visualization of neural networks from different perspectives to improve interpretability [M01].
- Investigating and working explanations of loss jump phenomenon [M03].

March 2020 - **Tsinghua University**, *Department of Earth System Science*.

July 2020 *Research Intern*, under supervision of [Prof.Zhichao Li](#).

- Participated in COVID-19 outbreak prediction in Brasilia and proposed to combine multimodal information to improve the accuracy [R01].

January 2020 **Harbin Institute of Technology & the University of Adelaide**.

till now *Practical Projects*, under supervision of [Prof.Shengping Zhang](#) and [Prof.Yuankai Qi](#).

Out of passion to ML, I've been honored to lead a team of 5-10 classmates to investigate and implement insightful ML ideas like *Multi-Label Classification*, *Image Denoising*, and *Style Transfer*.

- Proposed a new loss in *DGCNN* image denoiser to improve the image resolution.
- Designed "*Artistic Cloud Blog*" for instant *Style-Transfer* of arbitrary images/videos.
- Implemented a full pipeline of stock data crawling and analysis with Hadoop, Hive and Django.

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## Selected Extracurricular Activities

September 2016 **Public Student Service**.

till now I love participating in social activities, where I offer my help to others and learn to build up my leadership and teamwork ability. Till now, I've been involved in around 4 student services, where up to 163k+ students got benefits from my countless volunteer hours.

- **Class Commissary in charge of Study**: Organized several academic lectures.
- **Counselor Assistant**: Provided consulting and activity arrangements service.
- **Teach Assistant**: Presented lectures about *Calculus* and *Probabilistic Theory*.

Whole Life **Public Volunteer Service**.

I am more than willing to devote myself to helping others.

- **Founder and Lecturer of HITwh Lectures Group**: Recorded videos in [Bilibili Platform](#)(one of the most popular video platforms in China) with more than **163K** views.
- **COVID-19 Service**: Helped in measuring temperature of incoming and outgoing people in Community Pandemic Prevention and Control Center, Hefei, China.
- **English Translator**: Offered English translation service for students from UK, Australia, South Korea, etc.

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## Competitive Skills & Hobbies

- **Deep Learning Framework**: Pytorch, TensorFlow(2.0), Fast.ai.
- **Programming Languages**: C, C++, Java, Python,  $\text{\LaTeX}$ , HTML/CSS/Javascript.
- **Chess**: Chinese National Level 2 Athlete, Anhui provincial championship record holder.
- **Piano**: Co-played with [Lang Lang](#)(one of the Most Talented Pianists in the world).
- **Vocal**: Multiple awards in vocal and singing competitions.