

HAN, FEIYU

hanfeiyu17@mailsucas.ac.cn | +86 188-01119360

EDUCATION BACKGROUND

UNIVERSITY OF CHINESE ACADEMY OF SCIENCES

BEIJING

Major in mathematics and applied mathematics, Bachelor of Science

09/2017 - 06/2021

- **GPA:** 3.76/4.00; GPA for major courses: 3.90/4.00
- **GRE:** Verbal 170 (99th percentile) + Quantitative 170 (96th percentile) + Analytical Writing 4.0 (55th percentile)
- **GRE subject (Mathematics):** 930 (98th percentile)
- **Related Courses:** Mathematical Analysis, Probability Theory, Mathematical Statistics, Numerical Analysis, Real Analysis, Functional Analysis, Complex Analysis, Linear Algebra, Abstract Algebra, Differential Geometry, Topology

RESEARCH EXPERIENCES

BAYESIAN OPTIMIZATION BASED ON SUBSPACE TECHNIQUES

BEIJING

Advisor: Professor Xin Liu, Chinese Academy of Sciences

08/2020 - 03/2021

- Realized Bayesian optimization via Python and compared the efficiency difference between Bayesian optimization algorithm and other famous black box algorithms like Grid Search, Random Search, Powell Optimization via MATLAB
- Solved the limitation that Bayesian optimization can only address problems of moderate dimension by applying Subspace techniques. Proposed a new Bayesian optimization algorithm based on Subspace techniques and created its corresponding optimizer via Python
- Built an evaluation system to compare the efficiency of different gradient-free optimization methods, and used numerical simulations to demonstrate the superiority of our algorithm via MATLAB
- Applied our new algorithm to a high-dimensional dataset and developed the optimizer for recommendation systems.

CAPTURED CHROMATIN INTERACTIONS AND DETERMINED THE 3D STRUCTURE OF CHROMOSOMES BASED ON TRI-C METHOD

US/CHINA

Advisor: Professor Jianrong Wang, MSU

07/2020 - 10/2020

- Conducted barcode identification by using Bowtie2 and Python; mapped the DNA fragments to reference genome
- Analyzed 3.6 billion loci on 24 chromosomes using market basket algorithm combined with Tri-c method and SPRITE-pipeline
- Used nonparametric hypothesis test to determine significant interactions and optimize hyperparameters
- Drew the heat map of the interaction between human chromosomes for establishing the three-dimensional folding model of the genome and analyzed the action pattern of regulatory elements and genes via R
- Compared and analyzed differences in chromosomal interactions based on the heat map and explained the relationship between transcription factors and chromatin interactions

DATA ANALYSIS BASED ON GRASSHOPPER POPULATION CONTROL

BEIJING

Advisor: Professor Na Zhang, Chinese Academy of Sciences

06/2019 - 12/2019

- Handled over 8 thousand pieces of environmental interaction data; constructed a huge ecological environmental interaction network composed of small hubs
- Applied modeling methods, such as GLMM, MCMCglmm, SAR and GWR, to study the interaction of different habitat factors and grasshopper population; processed the non-numeric arguments with lme4 package for R, and predicted principle value, intercept, and p-value via the linear fitting method

IMAGE CLASSIFICATION BY CNN METHOD-NATIONAL UNDERGRADUATE INNOVATION PROGRAM

BEIJING

Advisor: Professor Fuzhou Gong, Chinese Academy of Sciences

04/2019 - 11/2019

- Applied machine learning and Bayesian theory to complete image classification for CIFAR-100 data set via Python, and established identification model and code with high success rate by using Python.
- Built a complex structure model based on CNN, and further optimized and improved network models
- Connected scattered and independent pixel points with the semantic relationship expressed in the computer language to assist in object detection, image classification, and generation
- Analyzed the three basic structures of the CNN method and focus on the implementation of gradient disappearance and gradient explosion in the BP process

LEADERSHIP & ACTIVITIES

PROBABILITY THEORY SEMINAR AT UNIVERSITY OF CHINESE ACADEMY OF SCIENCES

BEIJING

Co-Chair

09/2019 - 01/2020

- Assigned tasks and organized students to read the conference papers efficiently and complete the corresponding tasks
- Led the meetings, collated the information of the seminar speakers and arranged the meeting time

CREATIVE WRITING CLUB

BEIJING

Student Leader

09/2018 - 09/2019

- Organized the English Poetry Creation Contest on campus in 2019, attracting over 120 participants
- Responsible for managing and updating member networks and hosting regular meetings

INSTITUTE OF BIOLOGY, CHINESE ACADEMY OF SCIENCES

BEIJING

Volunteer

08/2018 - 09/2018

- Collected experimental data of ecology, environmental science and pharmacy and conducted relative data processing

SKILLS & INTERESTS

- **Languages:** Mandarin (Native); English (Fluent; TOEFL 109/120: Reading 30, Listening 30, Speaking 23, Writing 26)
- **Technical:** Proficient knowledge of MS Office; Familiar with R/Python/Linux/MATLAB/SQL (Basic)
- **Interests:** Acrylic Painting, 3D Modeling (Member of the Propaganda Department of the Student Union)