Bai Yunpeng

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EDUCATION

National University of Singapore — Singapore
Final Year Ph.D. - CS; Advisors: Prof.Shengdong Zhao, Antti Oulasvirta, and David Hsu — *2022 - Present*
Core Courses: *Advanced Topics in HCI, Information Visualization, Knowledge Discovery and Data Mining, Neural Networks and Deep Learning, Advanced Topics in IoT, Advanced Topics in AI*

The University of Melbourne — Melbourne, Australia
Bachelor of Engineering, Exchange - ME; WAM: 82.6/100 (First Class Honor) — *2019 - 2020*
Core Courses: *Numerical Programming for Engineers, Systems Modelling and Analysis, Control System, Introduction to Machine Learning, Programming and Software Development*

Beijing Institute of Technology — Beijing, China
Bachelor of Engineering - ME; WAM: 87.5/100 (Top 5%) — *2016 - 2020*
Core Courses: *Mechanical Design, Mechanisms and Machine Theory, Mechanical Drawing, Calculation Method, Theoretical Mechanics, Mechanics of Materials, Fluid Mechanics, Thermodynamics, Mechanics and Materials*

WORK EXPERIENCE

Computational Behavior Lab — Espoo, Finland
Visting PhD Student (Full-time); Supervised by Antti Oulasvirta — *2024 - 2025*
- **Research on computationally rational model**: Reading Model.

HUAWEI Human Machine Interaction (HMI) Lab — Shenzhen, China
Intern Researcher (Full-time); Supervised by Xuan Zhou, Qiang Xu, Zhaopeng Gu — *2020 - 2021*
- **Hand Gesture Recognition in the Near-the-Ears Region Using Audio Signals**: Traditional human activity recognition algorithm based on audio signal.
- **Earphone Wearing Direction Recognition using IMU Signals**: Traditional human activity recognition algorithm based on IMU signal.
- **Game Controller Design and Real-time Haptic Feedback Auto-Generation**: Hardware design and manufacture; Haptic-audio interaction design and algorithm development

BIT RoboMaster Team — Beijing, China
Robot Chassis Mechanical Designer and Engineer (Part-time) — *2018 - 2019*
- **Robot Chassis Design and Manufacture**: Designed, manufactured, and built the mechanical parts of robot's chassis from raw materials.

PAPERS AND PATENTS

(CHI '26 EA) A Resource-Rational Principle for Modeling Visual Attention Control
Yunpeng Bai

(CHI '26 STAR) Simulation-based Optimization for Augmented Reading
Yunpeng Bai, Shengdong Zhao, Antti Oulasvirta

(Under Review) Hierarchical Resource Rationality Explains Human Reading Behavior
Yunpeng Bai, Xiaofu Jin, Shengdong Zhao, Antti Oulasvirta

(CHI '24) Heads-Up Multitasker: Simulating Attention Switching On Optical Head-Mounted Displays
Yunpeng Bai, Aleksi Ikkala, Antti Oulasvirta, Shengdong Zhao, Lucia J. Wang, Pengzhi Yang, Peisen Xu

(CVPR '26) BrepVGAE: Variational Graph Autoencoder with Unified Latent Representation for B-rep
Hao Guo, Liyuan Deng, Yongkang Dai, Ruohan Wang, Jiahao Li, Yunpeng Bai, Yilei Shi

(CVPR '26) AutoRegressive Generation with B-rep Holistic Token Sequence Representation
Jiahao Li, Yunpeng Bai, Yongkang Dai, Hao Guo, Hongping Gan, Yilei Shi

(CN Patent 2023) Headphone Control Method and Related System, Storage Medium
Wenhao Wu, Yunpeng Bai, Qiang Xu, Yuhao Zeng

(CHI '25) Chartist: Task-driven Eye Movement Control for Chart Reading
Danqing Shi, Yao Wang, Yunpeng Bai, Andreas Bulling, Antti Oulasvirta

(CVPR '25) BrepGiff: Lightweight Generation of Complex B-rep with 3D GAT Diffusion
Hao Gao, Xiaoshui Huang, Jiacheng Hao, Yunpeng Bai, Hongping Gan, Yilei Shi

(ICMR '25) BRepFormer: Transformer-Based B-rep Geometric Feature Recognition
Yongkang Dai, Xiaoshui Huang, Yunpeng Bai, Hao Guo, Yilei Shi

(ETRA '25) Decoding Cognitive Load: Eye-Tracking Insights into Working Memory and Visual Attention
Xiaofu Jin, Yunpeng Bai, Lina Xu, Shuai Ma, Danqing Shi, Luwen Yu, Mingming Fan

(ICCV '25) MamTiff-CAD: Multi-Scale Latent Diffusion with Mamba+ for Complex Parametric Sequence
Liyuan Deng, Yunpeng Bai, Yongkang Dai, Xiaoshui Huang, Hongping Gan, Dongshuo Huang, Hao Jiacheng, Yilei Shi

(In Submission) Distinguishing Intrinsic and Extraneous CognitiveLoad Using Eye-Tracking and Wavelet-Base
Xiaofu Jin, Yunpeng Bai, Lina Xu, Shuai Ma, Danqing Shi, Luwen Yu, Mingming Fan

HONORS AND AWARDS

- **NUS Overseas Research Immersion Award (ORIA)**
  This award is to support NUS students who have outstanding research cooperation overseas.   *2024*

- **NUS SoC Research Incentive Award**
  This award is given to NUS students who have demonstrated good academic standing and research progress.   *2023*

- **Golden Glasses Award for Best Design**
  2022 Summer Bootcamp of future interaction for smart glasses   *2022*

- **Melbourne Graduate Scholarship**
  It is offered to high achieving international students in recognition of their excellent academic results   *2020*

- **2 × China National Scholarship**
  Highest scholarship given by Chinese government, top 1 %   *2017, 2018*

- **4 × First; 1 × Second; 1 × Third Class BIT SoM Scholarship**
  Semester scholarship given by school of mechanical engineering, BIT   *2017 to 2019*

- **Ranked 1000 in National College Entrance Exam (Gaokao), ShanXi Province**
  Scores 631/750, top 0.3%   *2016*

LEADERSHIP AND COMMUNITY ACTIVITIES

- **NUS SSI Monthly AX Talks**
  Coordinator and Host   *2022 to 2024*

- **NUS SSI 2023 Retreat**
  Organizer and coordinator   *2023*

- **NUS HCI 2022 Retreat**
  Organizer   *2022*

- **Italy Monsarrat Foundation - BIT Summer Social Research**
  Team member, School Research Group Leader   *2018*