

ZHANG CHENYU

2200010814@stu.pku.edu.cn | No. 5 Yiheyuan Rd, Haidian, Beijing, 100871, China | 13911968810

EDUCATION

Peking University (PKU), School of Mathematical Sciences Bachelor of Science Candidate; Major in Statistics <i>Coursework:</i> Advanced Algebra, Probability Theory, Mathematical Statistics, Applied Stochastic Processes, Mathematical Modeling, Ordinary Differential Equations, Functions of Real/Complex Variables, Mathematical Analysis, Machine Learning, High-Dimensional Probability, Data Structure and Algorithm, Functional Analysis, Computational Photography: Image Formation Theory and Deep Learning, Financial Mathematics	Beijing, China Sep 2022- Expected May 2026
Carnegie Mellon University (CMU), Machine Learning Department Research Associate in Machine Learning	Remote / Pittsburgh, PA Jan 2025- Nov 2025
University of California Berkeley, Summer Session <i>Coursework:</i> Introduction of Astronomy; GPA: 4.0/4.0	Berkeley, CA Jun 2024- Aug 2024

RESEARCH EXPERIENCE

RobotArena: Unlimited Robot Benchmarking via Real-to-Sim Translation

Advised by Dr. Katerina Fragkiadaki at CMU; Submitted to ICLR2026 Mar 2025- Present

- Built a real-to-simulation reconstruction pipeline that converts teleoperation videos into physics-consistent 3D environments through generative scene modeling and differentiable rendering
- Created an automatic calibration algorithm with 3D Gaussian alignment, reducing camera-robot pose error to sub-centimeter without manual supervision
- Constructed large-scale evaluation protocols integrating vision-language scoring with human preference feedback, supporting quantitative comparison across over one hundred simulated environments
- Performed robustness analysis of generalist robot policies under domain shifts in color, lighting, and geometry, quantifying performance degradation across model families
- Introduced a unified benchmarking framework connecting real-world datasets such as BridgeV2, DROID, and RH20T, supporting reproducible evaluation for cross-domain policy generalization

Generative 3D Object Particle Dynamics

Advised by Dr. Katerina Fragkiadaki at CMU; Submitted to ICLR2026 Jan 2025- Present

- Developed *ParticleDiffuser*, a diffusion-based 3D dynamics model that predicts object-particle and robot gripper trajectories from point-cloud inputs, covering rigid, soft, and deformable objects
- Implemented latent-query attention and recurrent training for long-horizon rollouts, reducing multi-step prediction error by around 40% on held-out tasks versus GNN baselines and mitigating 90-step drift
- Designed a goal-conditioned guided-diffusion controller that generates robot actions consistent with target object states, achieving up to $3\times$ lower MSE and $20\times$ faster planning than MPC baseline
- Curated a 30k-trajectory Genesis simulation corpus spanning interactions with standardized splits, enabling robust training and evaluation of diffusion-based dynamics models
- Demonstrated sim-to-real transfer of learned models in real robotic manipulation tasks, validating cross-domain generalization of diffusion-based dynamics prediction

SCAP: Transductive Test-Time Adaptation via Supportive Clique-based Attribute Prompting

Advised by Dr. Jiahuan Zhou at PKU; Submitted to CVPR2025 Jun 2024- Jan 2025

- Explored cross-sample attribute consistency by identifying supportive cliques of visually similar samples and learning shared representations that strengthen the model's adaptability during testing
- Built an attribute prompting mechanism that jointly optimizes image and text cues for each clique, guiding the model toward fine-grained and discriminative visual features
- Designed a retention module that continuously preserves and aggregates attribute information from previous batches, allowing the model to maintain stability and adapt to evolving test distributions
- Demonstrated consistent improvements on ImageNet-A, ImageNet-R, and ImageNet-Sketch, achieving higher accuracy and stronger generalization than existing test-time adaptation methods

Optimizing Neural Scene Representations with Enhanced Feature Fusion in PointNeRF

Computational Photography In-class Final Project at PKU Apr 2024- Jun 2024

ZHANG CHENYU

2200010814@stu.pku.edu.cn | No. 5 Yiheyuan Rd, Haidian, Beijing, 100871, China | 13911968810

- Enhanced PointNeRF's neural scene representation by adding an MLP layer with positional encoding, achieving more accurate volumetric density modeling and smoother feature fusion
- Reproduced NeRF and PointNeRF experiments using custom datasets, resolving data calibration and camera pose configuration issues to ensure stable reconstruction results

Dual-Modal Online Prompting with Dual-Level Adaptive Knowledge Retention for Test-Time Adaptation

Advised by Dr. Jiahuan Zhou at PKU; Submitted to TPAMI 2024

Nov 2023- Jul 2024

- Developed D2ART, a dual-modal adaptive prompting framework that enhances CLIP-based vision-language models through dynamic image and text prompt optimization during test-time inference
- Designed a dual-level knowledge retention mechanism that adaptively preserves high-confidence representations at both input and feature levels, enabling continual adaptation without catastrophic forgetting
- Implemented entropy-guided prompt updates and EMA-based feature stabilization, improving model robustness to unseen domains and frequent distribution shifts
- Achieved consistent performance gains across ImageNet-A, ImageNet-R, and ImageNet-Sketch benchmarks, improving top-1 accuracy by up to 2.3% on ImageNet-A over state-of-the-art test-time adaptation methods

PROFESSIONAL EXPERIENCE

Foshan Ailebo Robot Co., Ltd.; Automation Engineering Intern; Hybrid / Foshan, China Jan 2025- May 2025

- Engaged in the setup and calibration of robotic arms and automated production lines
- Conducted PLC testing and debugging to enhance system responsiveness and fault tolerance
- Supported integration of sensors, servo motors, and control units across mechanical systems
- Contributed to process optimization through data logging and performance analysis

LEADERSHIP EXPERIENCE

PKU Student Association Athletics Department; Associate Director; *Beijing, China* Sep 2022 - May 2024

- Coordinated basketball operations for over 200 student athletes across 6 intercollegiate teams, managing referee assignments, match scheduling, and weekly training logistics
- Organized 10+ campus-wide events annually, including seasonal tournaments and skill workshops, ensuring smooth execution under tight facility and academic schedules
- Wrote and published 15+ promotional articles on the college's WeChat official account, generating an average of 2,000+ reads per post and enhancing student engagement
- Competed in the Freshman Tennis Tournament, contributing to the team's third-place finish among 12 participating schools

SKILLS & INTERESTS

Computer Skills: Python, Java, R, SQL, STATA, Tableau, Azure, AWS, Spark

Interests: Tennis, Pickleball, Basketball, Piano, Chess, Football