Da, Longchao

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EDUCATION

- **Arizona State University** — Arizona, USA
  Ph.D. Student of Computer Science; — *August 2023 - now*
  Interest: *LLMs, Foundation Model, Reinforcement Learning, Sim2Real, Policy Evaluation*

- **New Jersey Institute of Technology** — New Jersey, USA
  Research Assistant of Informatics; — *July 2021 - May 2023*
  Interest: *Data Mining, Reinforcement Learning.*

RESEARCH DIRECTIONS

- **LLMs & Foundation Models and Trustworthiness**:
  1. Augmented LLM agent for domain specific tasks with tool embodiment. [IJMLC24, ICLR24-LLMAgent]

  2. Trustworthy LLM with RAG enhanced evidential answering [CIKM2024-RAG Workshop], Linguistics informed LLM uncertainty quantification. [In submission AAAI25]

  3. Free-form text segmentation for Medical Images, Landuse segmentation on Satellite Images. (Foundation Models - SAM)

- **Mitigate Sim2Real Problem in RL**:
  1. Uncertainty based action grounding for Sim2Real gap mitigation in RL. [CDC23]

  2. System dynamics capturing with prompt learning for Sim2Real gap solution in RL. [AAAI24-Oral(5%)]

  3. More realistic and efficient simulator with customizable driving behaviors to mitigate the transition gaps. [ECML-PKDD24]

  4. Policy evaluation for better understanding the performance prior to deployment. [AAAI24]

- **Solving Real World Problem**:
  1. Solving the shaded routing problem by with SAM-based model - a deployed system in service. [CIKM24]

  2. Realistic traffic signal control problems in roundabouts - Sedona, AZ, Arizona Department of Transportation. (ADOT)

  3. CityLearn challenge on optimal energy control policy learning for multi-agent systems. (No.15 of 792 participants)

  4. Smart Community: A system promotes people's enthusiasm for voluntary affairs, stable operation. (80,000+ active users)

PUBLICATIONS, TUTORIALS AND PATENTS

- [**AAAI 2024 - Oral**] **Prompt to Transfer: Sim-to-Real Transfer for Traffic Signal Control with Prompt Learning**: Mitigate the sim2real transfer performance impairment in Reinforcement Learning by leveraging LLMs' inference ability (**first author**).

- [**AAAI 2024**] **Probabilistic Offline Policy Ranking with Approximate Bayesian Computation**: Offline policy evaluation for Reinforcement Learning methods (**first author**).

- [**CIKM 2024**] **Shaded Route Planning Using Active Segmentation and Identification of Satellite Images**: A sustainable routing strategy for residents under heatwaves using foundation models and satellite images. (**first author**)

- [**ECML-PKDD 2024**] **CityFlowER: An Efficient and Realistic Traffic Simulator with Embedded Machine Learning Models**: Improve the realism in microscopic level traffic simulation while keeping high efficiency. (**first author**)

- [**ITSC 2024**] **SynTraC: A Synthetic Dataset for Traffic Signal Control from Traffic Monitoring Cameras**: An open-sourced dataset for real-world Traffic Signal Control policy learning.

- [**IJMLC, ICLR 2024 @ LLM Agent**] **Open-TI: Open Traffic Intelligence with Augmented Language Model**: An open-sourced traffic intelligence using Augmented Language Model (**first author**).

- [**ICLR 2024 @ LLM Privacy**] **Privacy-preserving Fine-tuning of Large Language Models through Flatness**: Address privacy issue in LLM training process.

- [**arXiv 2024**] **LLM Uncertainty Quantification through Directional Entailment Graph and Claim Level Response Augmentation**: Identify the trustworthiness from LLMs response for better decision making. (**first author**)

- [**Machine Learning - 2023**] **LibSignal: An Open Library for Traffic Signal Control**: Provide cross-simulator training and testing bed for Classic and SOTA algorithms. Also accepted by NeurIPS 2022 workshop.

- [**IEEE-CDC 2023**] **Uncertainty-aware Grounded Action Transformation towards Sim-to-Real Transfer for Traffic Signal Control**: Uncertainty quantification to the action grounding process in sim2real problems (**first author**).

- [**IEEE-CASE 2023**] **Sim2Real Transfer for Traffic Signal Control**: First to formalize the sim2real problem in Traffic Signal Control and propose possible solutions as early edge explorations (**first author**).

- [**IEEE-ITSC 2023**] **Cross-simulator Datasets and Evaluations for Traffic Control Policies**: Host tutorial of our open-sourced library in the top-venue conference IEEE International Conference on Intelligent Transportation Systems.

- [**CIKM 2022/Electronic Research Archive**] **CrowdGAIL: A Spatial-Temporal Aware Method for Agent Navigation**: A social-aware method with Generative Adversarial Imitation Learning to solve agent navigation tasks by trajectory prediction (**first author**).

- **[Chemrxiv 2024] Prediction of the Potential Energy Surface for Polyatomic Molecule with the Three Dimensional Special Euclidean Equivariant Transformer Network**: Leverage SE(3) Transformer Network to assure the high-accurate molecular energy surface prediction (**first author**).
- **[P1] A method for automatic identification of bolt CAD drawing(co-inventor)**: C.N. Patent Application CN 112434502 A, filed November, 2020. Patent Pending.
- **[P2] A self-interpretation method for network discrimination of partial black box problems(co-inventor)**: C.N. Patent Application CN 112434790 A, filed November, 2020. Patent Pending.
- **[P3] The utility model relates to an arm strength training device(co-inventor)**: C.N. Patent Application CN 112741986 A, filed February, 2021. Patent Pending.

ABILITIES

- **Python**: Pytorch, Tensorflow, Numpy, Pandas, Matplotlib, DataShader
- **JAVA**: Springboot, SpringMVC, Shiro, JAVA-Swing, JVM
- **DataBase/Data**: MySQL, Oracle, SQLite, Scala(big data), Spark-SQL

HONORS AND AWARDS

- In Top30 from nation-wide selection of CS/OR Ph.D. students in AI-SCORE summer school - May, 2024.
- **SCAI Doctoral Fellowship at Arizona State University** - March, 2024.
- Third prize of the NJIT-DANA KNOX Student Research Showcase (Graduate group) - April, 2023.
- NSF travel award by CIKM - September, 2022 and 2024.
- Awarded as outstanding student & outstanding graduate thesis - June, 2022.
- Innovation achievement award first prize - 2021.
- National university student mathematical modeling provincial first prize - August, 2021.
- National and provincial project approval of college student innovation and entrepreneurship - 2021, 2019 (twice).

EXPERIENCE

- **AI Scientist Intern** GE-Healthcare: 2024 Summer, USA
  Foundation Models and Segmentation

- **RL Research Intern** Zhejiang Lab: 2023 Summer, CHN
  Reinforcement Learning and Drug Discovery

- **Data Analyst Intern** YunQi Academy of Engineering: 2022 Summer, CHN
  Data-driven Research on Satellite Image Data Mining

RESEARCH COMMUNITY AND SERVICE

- Program Committee Member of WWW 2024.

- Program Committee Member of ADMA 2024.
- Peer Reviewer of WACV 2025.
- Peer Reviewer of ICPR 2024.
- Peer Reviewer of PAKDD 2024.
- Peer Reviewer of CASE 2023.
- Peer Reviewer of NurIPS 2022.
- Reviewer of IEEE Transactions on Intelligent Transportation Systems. 2023.
- Reviewer of IEEE Transactions on Computational Social Systems. 2023.
- Host of the Tutorial in IEEE-ITSC - Bilbao, Spain, 2023.

- **SigmaXi Scientific Research Honor Society Member** (Only by nomination).
- IEEE Regular Membership of Yong Professionals.
- IEEE Regular Membership of Robotics and Automation Society.
- Association for the Advancement of Artificial Intelligence (AAAI) Student Membership.