Xiongming Dai

Ph.D. Candidate
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Research and Hobbies

I am a Ph.D. candidate at Louisiana State University. Currently, I am working towards State Estimation for Sequential Data Analysis. I have been actively involved in various inter-disciplinary researches. My research interest includes Bayesian Learning, Monte Carlo Sampling, Tracking, Simultaneous Localization and Mapping (SLAM), Robotics, Anomaly Detection (Deep One-Class Learning), Optimal Control and Estimation, Markov Decision Process and Deep Reinforcement Learning. I am passionate about Mathematics, Cooking, Drawing and Playing Basketball & Badminton.
I am looking for a full-time job related to Deep Reinforcement Learning, Machine Learning, Computer Vision, Robotics, Autonomous Driving (Visual SLAM) now!

Experience

Graduate Research & Teaching Assistant Louisiana State University May 2018 - Present

- Responsible for theoretical research of resampling for sequential Monte Carlo, and have proposed a repetitive ergodicity in deterministic domain with median, it is faster than the state of the art, which is verified by theoretical deduction and experiments of a hidden Markov model in both the linear and non-linear cases.
- Responsible for theoretical research of optimal camera configuration for large-scale motion capture systems, a NP hard problem, and have developed a 3D simulation framework, further introduce Riesz potentials to discretize rectifiable submanifolds of the maximum overlapping coverage, it proves that the proposal grows at most logarithmically, under mild assumptions.
- Responsible for theoretical research of Monte Carlo Sampling, and have proposed a weighted Riesz potentials interaction, where only few samplers required to achieve high performance for hidden Markov model.

Director Shenzhen Realis Multimedia Technology Co.,Ltd. Jul 2016 - Aug 2017

- Responsible for the location and tracking of infrared reflective markers corresponding to rigid bodies to realize multiplayer motion capture.
- Responsible for the optimization of optimal camera configuration solutions.
- Responsible for the optimization of the inverse kinematics and the integration of the system.

Project Leader Shenzhen Realis Multimedia Technology Co.,Ltd. Feb 2016 - Jun 2016

- Served as a leader for developing inverse kinematics software from scratch.
- Responsible for the configuration and optimization of the infrared reflective markers solution so that the corresponding rigid body is most easily captured by the camera system.
- Responsible for the interactive communication mechanism between cameras to ensure minimum latency of the camera system.

Senior Software Development Engineer Hunan VisualTouring Technology Co.,Ltd. Jun 2015 - Jan 2016

- Responsible for service robot multitasking development based on robotic systems ROS.
- Responsible for theoretical research of Visual SLAM and related software development.
- Responsible for 3D reconstruction of interior scenes.
- Responsible for 3D face recognition based on 3-dimensional projection volume invariance feature.

Graduate Research Assistant Huazhong University of Science & Technology Aug 2012 - May 2015
Software Development Engineer Huazhong Numerical Control Co.,Ltd. Aug 2012 - May 2015

- Responsible for calibration research and software development of industrial robot systems.
- Responsible for the algorithm research and software development of CNC toolpaths in order to obtain smooth machining results.

Education

Louisiana State University	Computer Science	Ph.D., (Nov, 2022 (Expected))
Louisiana State University	Computer Science	M.Sc., 2022
Huazhong University of Science & Technology	Mechatronical Engineering	M.Eng., 2015
Changsha University of Science & Technology	Mechanical Engineering	B.Eng., 2012

Publications

• **Xiongming Dai,** Gerald Baumgartner. **Weighted Riesz Particles.** Neural Information Processing Systems(NeurIPS), 2022 submitted

• **Xiongming Dai,** Gerald Baumgartner. **Optimal Camera Configuration for Large-Scale Motion Capture Systems.** Neural Information Processing Systems(NeurIPS), 2022 submitted

• **Xiongming Dai,** Gerald Baumgartner, **Variance Reduction of Resampling for Sequential Monte Carlo.** Association for the Advancement of Artificial Intelligence(AAAI), 2022 submitted

Awards

• Three software copyright

• 2nd place in the 3rd Changsha University of Technology Cooking Competition

• 2009-2010 School of Mechanical Engineering at Changsha University of Sci&Tech 1 on 1 Basketball competition champion, called “The King of 1 on 1”.

• The team got the 3rd place in the 15th HUST Graduate Cup Soccer League, Forward

• The team got the 2nd place in the 25th HUST Graduate Cup Basketball League, Small Forward

Technical Strengths

- **Languages Proficient:** Python, R, Matlab, C/C++, Shell.
- **Robotic System:** ROS operating system
- **GPU Programming:** NVIDIA CUDA
- **Computer Vision/Graphics:** OpenGL, OpenCV.
- **SDLC/Documentation:** LaTex, Overleaf
- **Platforms/ Frameworks:** Windows, UNIX/Linux •
- **Others:** Git
- **The Most Important:** non-stopable and perseverance in learning