

Jing Dong

CONTACT INFORMATION

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RESEARCH INTEREST

My current research interest covers various topics in robotics and computer vision, include *simultaneous localization and mapping (SLAM)*, *3D reconstruction*, and *real-time online motion planning*.

EDUCATION

Georgia Institute of Technology, Atlanta, GA

- Ph.D., Computer Science Aug 2013 - Aug 2018 (Expect)
- Advisor: Prof. Frank Dellaert & Prof. Byron Boots
- GPA: 3.90/4.0

Tsinghua University, Beijing, China

- B.E., Engineering Mechanics and Aerospace Engineering Aug 2008 - July 2012
- GPA: 91.8/100, Rank: 3/84
- Graduate with honors

RESEARCH EXPERIENCE

Graduate Research Assistant

Georgia Institute of Technology, Atlanta, GA Aug 2013 - Present

- 4D Agriculture: Time-series 3D reconstruction/crop analysis for precision agriculture
 - Built a camera/IMU/GPS data collection system, collected 4 years datasets in Tifton, GA.
 - Proposed time-series 3D reconstruction (4D) algorithm, and implemented in C++.
 - Working on machine learning algorithms for yield prediction from 4D reconstruction results.
- Real-time motion planning as a probabilistic inference framework
 - Proposed Gaussian process (GP) based motion planning algorithm for real-time and online replanning, and implemented in C++.
 - Proposed Kinect volumetric 3D reconstruction for planning, and implemented in C++/CUDA.
- Real-time distributed and cooperative multi-robot mapping
 - Proposed an online and real-time multi-robot SLAM algorithm.
 - Implemented in C++, and tested on CMU 2D laser multi quadrotor dataset.

Research Intern

Microsoft Corporation, Redmond, WA May 2017 - Aug 2017

- Deep learning based feature learning and matching for time-series and multi-spectral images
 - Proposed CNN image feature learning algorithm, and implemented in Python/TensorFlow.
- Time-series and multi-spectral 3D reconstructions for precision agriculture
 - Implemented time-series and multi-spectral 3D reconstruction algorithms in C++.

Intern Robotics

iRobot Corporation, Bedford, MA May 2015 - Aug 2015

- Computer vision based 3D mapping and localization

Visiting Student

Carnegie Mellon University, Pittsburgh, PA Jun 2014 - Aug 2014

- Multi quadrotors systems for distributed and cooperative mapping
 - Built UDP/Wi-Fi communication protocol for multi-quadrotor SLAM in C++.

Hardware Engineer

Beijing Sonimed Technologies Co., Ltd., Beijing, China Jan 2013 - Jul 2013

- Hardware design of piezoelectric bleeding-less surgical instrument
 - Designed the ultrasonic power amplifier and main PCB for piezoelectric surgical cutter.
 - Tested and improved the hardware designs to meet EMC standards.

REFEREED
PUBLICATION
(*EQUAL CONTRIBUTION)

1. **J. Dong**, M. Mukadam, B. Boots, F. Dellaert, Sparse Gaussian Processes on Matrix Lie Groups: A Unified Framework for Optimizing Continuous-Time Trajectories. Accepted in *IEEE International Conference on Robotics and Automation (ICRA)*, 2018.
2. M. Mukadam*, **J. Dong***, X. Yan, F. Dellaert, B. Boots, Continuous-Time Gaussian Process Motion Planning via Probabilistic Inference. Conditionally accepted in *International Journal of Robotics Research (IJRR)*, *ArXiv preprint 1707.07383*, 2017.
3. **J. Dong**, J. Burnham, B. Boots, G. Rains, F. Dellaert, 4D Crop Monitoring: Spatio-Temporal Reconstruction for Agriculture. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.
4. M. Mukadam, **J. Dong**, F. Dellaert, B. Boots, Simultaneous Trajectory Estimation and Planning via Probabilistic Inference. In *Robotics: Science and Systems (RSS)*, 2017.
5. **J. Dong**, M. Mukadam, F. Dellaert, B. Boots, Motion Planning as Probabilistic Inference using Gaussian Processes and Factor Graphs. In *Robotics: Science and Systems (RSS)*, 2016.
6. V. Indelman, E. Nelson, **J. Dong**, N. Michael, F. Dellaert, Incremental Distributed Inference from Arbitrary Poses and Unknown Data Association: Using Collaborating Robots to Establish a Common Reference. In *IEEE Control Systems Magazine*, 2016.
7. **J. Dong**, E. Nelson, V. Indelman, N. Michael, F. Dellaert, Distributed Real-time Cooperative Localization and Mapping using an Uncertainty-Aware Expectation Maximization Approach. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2015.

OTHER
PUBLICATION

1. **J. Dong**, B. Boots, F. Dellaert, Sparse Gaussian Processes for Continuous-Time Trajectory Estimation on Matrix Lie Groups. *ArXiv preprint 1705.06020*, 2017.
2. M. Mukadam, **J. Dong**, F. Dellaert, B. Boots, STEAP: Towards Online Estimation and Replanning. In *RSS Workshop on POMDPs in Robotics*, 2017.
3. K. Ahlin *et al.*, Robotics for Spatially and Temporally Unstructured Agricultural Environments. Book chapter in *Robotics and Mechatronics for Agriculture*, 2017.
4. L. Carlone, **J. Dong**, S. Fenu, G. Rains, F. Dellaert, Towards 4D Crop Analysis in Precision Agriculture: Estimating Plant Height and Crown Radius over Time via Expectation-Maximization. In *ICRA Workshop on Robotics in Agriculture*, 2015.

SKILLS

Programming: C++(4 years), C(8 years), MATLAB(8 years), Python(1 year), CUDA(2 years)
Robotics software: ROS(4 years), OpenCV(6 years), GTSAM(4 years), TensorFlow(0.5 year)

TEACHING
EXPERIENCE

Georgia Institute of Technology

Graduate Teaching Assistant

- CS 3630 - Introduction to Robotics and Perception (undergraduate level) Spring 2017
- CS 3600 - Introduction to Artificial Intelligence (undergraduate level) Spring 2015

PROFESSIONAL
SERVICE

- Reviewer for Journals: Autonomous Robots
- Reviewer for Conferences: ICRA (2017, 2018), IROS (2015, 2016, 2017), AAMAS (2017)

AWARD

- Outstanding Graduate Honor, Tsinghua University 2012
- National Scholarship, Tsinghua University 2010, 2011
- First Class Scholarship in Academic Excellence, Tsinghua University 2009