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 - Dec 2018 (Expect)
  - Advisor: Prof. Frank Dellaert & Prof. Byron Boots
  - GPA: 3.88/4.0

Tsinghua University, Beijing, China

- B.E., Engineering Mechanics and Aerospace Engineering — Aug 2008 - July 2012
  - GPA: 91.8/100.0, 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 TensorFlow/Python.
- 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 Sonicmed Technologies Co., Ltd., Beijing, China — Jan 2013 - Jul 2013

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

Refereed Publication

1. **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.
2. M. Mukadam, **J. Dong**, F. Dellaert, B. Boots, Simultaneous Trajectory Estimation and Planning via Probabilistic Inference. In *Robotics: Science and Systems (RSS)*, 2017.
3. **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.
4. 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*, 2016.
5. **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 (*equal contribution)

1. 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.
2. **J. Dong**, B. Boots, F. Dellaert, Sparse Gaussian Processes for Continuous-Time Trajectory Estimation on Matrix Lie Groups. *Arxiv preprint 1705.06020*, 2017.
3. M. Mukadam, **J. Dong**, F. Dellaert, B. Boots, STEAP: Towards Online Estimation and Replanning. In *RSS Workshop on POMDPs in Robotics*, 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), TensorFlow(0.5 year), GTSAM(4 years)

Teaching Experience

Georgia Institute of Technology

Graduate Teaching Assistant — Spring 2017
- CS 3630 - Introduction to Robotics and Perception
  Undergraduate level, enrollment 200+

Graduate Teaching Assistant — Spring 2015
- CS 3600 - Introduction to Artificial Intelligence
  Undergraduate level, enrollment 200+

Professional Service

Reviewer for Journals
- Autonomous Robots (2016)

Reviewer for Conferences
- ICRA (2017, 2018), IROS (2015, 2016, 2017), AAMAS (2017)

Award

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