Jianzhu Huai

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Education

The Ohio State University *Columbus, OH*
Ph.D. in Geodetic Engineering *Jan 2013 - Dec 2016*
- Thesis, "Collaborative simultaneous localization and mapping (SLAM) with crowdsourced data".

Beihang University *Beijing, China*
M.S. in Road and Railway Engineering *Sep 2009 - Mar 2012*
- Thesis, "An object-based change detection approach for remotely sensed imagery".

Beihang University *Beijing, China*
B.S. in Civil Engineering *Sep 2005 - Jun 2009*
- Capstone project, "An object-oriented multi-scale image segmentation approach".

Summary

- 7+ years experience in sensor fusion, mapping and localization, and calibration, with sensors such as cameras, inertial measurement units(IMUs), depth cameras, LIDARs, and GPS receivers.
- 3+ years experience in static/dynamic code analysis and test-driven development.

Skills

DevOps Docker, Jenkins
Programming Proficient: C++, Python, Matlab; Intermediate: Java, Objective C, C#, LaTeX

Experience

Segway Robotics *Beijing, China*
Algorithm Engineer *Feb 2017 - Jun 2019*
- **Mapping**: Devised and tested algorithms for mapping indoor areas by selectively fusing camera, IMU, wheel, depth and 2D LIDAR data, algorithms for growing and sparsifying point-based visual inertial maps.
- **Odometry**: Devised and tested place recognition algorithms relative to point-based maps or occupancy grid maps, odometry algorithms for indoor robots with localization against maps.
- **Testing**: Set up continuous integration tasks with Jenkins for testing mapping and odometry algorithms on thousands of data sessions.
- **Calibration**: Calibrated cameras and IMUs individually, and spatiotemporally calibrated a camera, an IMU and a 2D LIDAR.

Grad Research, CEGE Dept., OSU(Prof. Dorota Grejner-Brzezinska) *Columbus, OH*
Researcher *Jan 2013 - Jan 2017*
- Developed collaborative localization and mapping algorithm using data collected by cameras and IMUs on smartphones.
- Developed stereo visual inertial localization and mapping algorithm with loop closure by using keyframe-based optimization.
- Developed an indoor reconstruction method by fusing data collected by a Kinect and an IMU.
- Developed an monocular visual inertial odometry method based on an extended Kalman filter(EKF) in Matlab.
- Developed GPS and IMU loose integration for odometry based on an EKF and a unscented Kalman filter(UKF).

Samsung Telecom Research Institute *Beijing, China*
Intern Researcher *Aug 2012 - Nov 2012*
- Adapted and tested face detection methods including the cascaded Viola-Jones classifier, discriminatively trained deformable part model (DPM).
- Created training data for classifiers in face detection.

Shuzhiyuan Info Tech Inc. *Beijing, China*
Intern Programmer *Feb 2012 - May 2012*
- Adapted a blob tracking algorithm to track moving objects in videos captured by stationary cameras.
- Designed heuristics to recognize movement patterns of these objects.

Grad research, Beihang University(Assoc. Prof. Yumin Tan) *Beijing, China*

Researcher *Sep 2008 - Jun 2011*

- Developed a hierarchical two-phase region growing technique constrainted by edge cues for segementing remotely sensed images.
- Developed a image segment classification approach based on fuzzy logic that considered textural and geometric information of segments.

Honors & Awards

Nov 2016	**Graduate Student Award**, Institute of Navigation (ION)
Sep 2009 - Mar 2012	**First Class Fellowship**, Beihang University, 3 out of 13 students
Sep 2009	**Excellent Graduate Honor**, China Civil Engineering Society, 31 out of 31 universities
2008	**Honorable Mention Team**, Mathematical Contest in Modeling, COMAP

Publication List

Journal Articles

[1] **J. Huai**, G. Jóźków, C. Toth, D. A. Grejner-Brzezinska, "Collaborative Monocular SLAM with Crowdsourced Data", Navigation **65**, 501–515 (2018).

[2] Y. Tan, **J. Huai**, Z. Tang, "Edge-Guided Segmentation Method for Multiscale and High Resolution Remote Sensing Images", Journal of Infrared and Millimeter Waves **29**, 312–315 (2010).

[3] Y. Tan, **J. Huai**, Z. Tang, W. Xi, "An Improved Hierarchical Segmentation Method for Remote Sensing Images", Journal of the Indian Society of Remote Sensing **38**, 686–695 (2010).

Conference Proceedings

[4] **J. Huai**, Y. Zhang, A. Yilmaz, "The Mobile AR Sensor Logger for Android and iOS Devices", 2019 IEEE SENSORS (Oct. 2019).

[5] **J. Huai**, G. Józków, C. Toth, D. Grejner-Brzezinska, "Collaborative Monocular SLAM with Crowd-Sourced Data", Proceedings of the 29th International Technical Meeting of the Satellite Division of the Institute of Navigation (ION GNSS+ 2016), event-place: Portland, Oregon (Sept. 2016), pp. 1064–1079.

[6] **J. Huai**, C. K. Toth, D. A. Grejner-Brzezinska, "Stereo-Inertial Odometry Using Nonlinear Optimization", Proceedings of the 28th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2015) (Sept. 2015), pp. 2087–2097.

[7] **J. Huai**, Y. Zhang, A. Yilmaz, "Real-Time Large Scale 3d Reconstruction by Fusing Kinect and IMU Data", ISPRS Annals of Photogrammetry, Remote Sensing and Spatial Information Sciences, Vol. II-3/W5 (2015), pp. 491–496.

Reports

[8] **J. Huai**, Y. Qin, F. Pang, Z. Chen, *Segway DRIVE Benchmark: Place Recognition and SLAM Data Collected by a Fleet of Delivery Robots*, tech. rep., arXiv: 1907.03424 (Segway Robotics, Beijing China, July 2019).