Tampere, Finland
+358504805190
junsheng.fu@tut.fi

Junsheng Fu

GitHub
Patents
Homepage

I am an experienced researcher in visual-based localization, passionate about autonomous driving, with 8 patents applications and 5 papers. I am interested in robust localization in variations of environmental and weather conditions using different sensors, e.g. radar, LIDAR, vision. I like to think "what if" and "how to", and enjoy applying Computer Vision and Deep Learning techniques to solve the challenges in autonomous driving.

Technical skills
Languages: Python, Matlab, C/C++
Frameworks: TensorFlow, Keras, CUDA, OpenCV, Scikit-learn,
Others: Camera pose estimation, Deep Learning, Tracking, SLAM, Git, Linux

Projects

3D Photo Gallery Application Demo
- Computed the 6-DoF camera poses for user-captured images using the **HERE** map.
- Augmented a 3D Map for interactively gallery photo browsing.
- Filed 2 patents applications and 1 research paper.

Interactive Video Playback System Demo
- Computed the 6-DoF camera poses for user-captured video key frames using the **HERE** map.
- Allowed the users to choose arbitrary viewpoints to playback the video in the map.
- Filed 2 patents applications and 1 research paper.

Camera Pose Estimation Demo
- Estimated 6-DoF camera poses of the query image using a reference image and point cloud.
- Implemented three approaches for 6-DoF camera pose estimation.
- Proposed a hybrid approach for 6-DoF camera pose estimation

Sensor Fusion-based Tracking Demo
- Designed and implemented Extended Kalman Filter and Unscented Kalman Filter for object tracking using LIDAR and radar data.

Particle Filter Demo
- Implemented a real-time particle filter to estimate the positions and orientations of a moving vehicle.

Experience

Tampere University of Technology **Doctoral Student** Finland | 1.2014-12.2017
- Implemented 10 autonomous driving demos with OpenCV, Python, Keras, and TensorFlow (videos).
- Served as teaching Assistant for "SGN-13006 Intro. to Pattern Recognition and Machine Learning", and got the best course reviews award from students in 2016 Fall Semester.

Nokia Research Center (Nokia Tech) **Computer Vision Researcher** Finland | 3.2012-12.2015
- Designed and implemented several projects in the field of visual-based localization with Here map.
- Implemented 3D reconstruction and visualization systems for indoor 3D smart sensing.

Tampere University of Technology **Research Assistant** Finland | 9.2010-12.2011
- Designed and implemented a real-time video denoising filter with C.
- Embedded a denoising filter into H.264/AVC codecs.

Demola **Software Engineer** Finland | 3.2010-8.2010
- Implemented a face tracking application in Nokia N900 mobile phone with OpenCV and QT.

Education

Tampere University of Technology, Finland - *Computer Vision*, **Ph.D.**	GPA: 4.83 / 5	2017
Tampere University of Technology, Finland - *Signal Processing*, **M.Sc**.	GPA: 4.45 / 5	2012
Hangzhou Dianzi University, China - *Telecommunication*, **B.Eng.**	GPA: 85 / 100	2009
Udacity - *Self-Driving-Car Engineer* Nanodegree		2017

Patents & Publications

- US20170132843A1, A Method and Technical Equipment for Determining a Pose of a Device, published 2017 (link).
- US 20160248985, Device with an Adaptive Camera Array, published 2016 (link).
- WO 2016102768 A1, Monitoring, published 2016 (link).
- EP 3051410 A1, An Apparatus and Associated Methods for Provision of Wireless Power, published 2016 (link).
- US 20160191796, Methods and Apparatuses for Directional View in Panoramic Content, published 2016 (link).
- US 20150155009, Method and Apparatus for Media Capture Device Position Estimate-Assisted Splicing Of Media, published 2015 (link).
- US 20140300775, Method and Apparatus for Determining Camera Location Information and/or Camera Pose Information According to a Global Coordinate System, published 2016 (link).
- US 20150109508, Method And Apparatus for Generating a Media Capture Request Using Camera Pose Information, published 2015 (link)
- J. Fu, L. Fan, K. Roimela, Y. You, and V.-V. Mattila: “A 3d Map Augmented Photo Gallery Application on Mobile Device”, IEEE ICIP 2014, France (link)
- J. Fu, J.-K. Kämäräinen, A. Buch, and N. Krüger: “Indoor Objects and Outdoor Urban Scenes Recognition by 3D Visual Primitives”, ACCV workshop 2014, Singapore (link)
- J. Fu, L. Fan, Y. You, and K. Roimela: “Augmented and Interactive Video Playback Based on Global Camera Pose”, the 21st ACM Multimedia, 2013, Spain (link).
- L. Fan, J. Fu, Y. You, K. Roimela, P. Piippo and V.-V. Mattila, "Deja Vu: A 3D map augmented photo gallery application on mobile devices", In IEEE ICCV 2013, Demo session, Australia.
- J. Fu, E. Belyaev and K. Egiazarian: “Rate-distortion Oriented Joint Video Pre-filtering and Compression”, the 10th conference of FRUCT, 2011, Finland (link).
- Junsheng Fu, Master Thesis 2011: A Real-Time Rate-Distortion Oriented Join Video Denoising and Compression Algorithm (link).

Honors and Activities

- TUT Graduate School Scholarship 2016-2017
- Nokia Foundation Scholarship 2014
- Sisu Award, NRC Multimedia Technology Lab 2013
- Runner-up in IIDA Idea Innovation Competition 2011
- Outstanding Graduate Award, Zhejiang China 2009
- Chairman of Tampere Chinese Student and Scholar Association 2014-2015
- Chairman of one Badminton Club in Tampere 2012