

PIYAPAT SARANRITTICHAJ

LinkedIn: [link](#)

WORK EXPERIENCE

Department of Engineering Cognitive Systems (Automated Driving), Robert Bosch GmbH, Germany 2017 - Present
Development Engineer [Programming with: C++, Python]

- Developing graph-based mapping framework (fusing measurements from Radar, Lidar, Camera, GPS receiver as well as internal sensors) for automated vehicles under [Bosch Road Signature](#) product
- Improving point cloud alignment algorithms to ensure high accuracy in different scenarios and modalities
- Enhancing mapping pipeline using robustification algorithms handling corrupted measurements and false estimations
- Developing mapping evaluation framework to assess mapping pipeline performance both qualitatively and quantitatively

Department of Guidance Navigation and Control Systems, German Aerospace Center, Germany 2015 - 2017
Scientific Staff [Programming with: C++, MATLAB, Simulink]

- Developed GPS-based onboard navigation software for [Eu:CROPIS](#) satellite (expected to be launched in 2018)
- Constructed hardware-in-the-loop testing framework in [TRON](#) to qualify optical navigation systems for space applications
- Verified TRON framework by analyzing image features detected from a high-resolution camera
- Developed navigation system based on Extended Kalman Filter for [EAGLE](#), a VTOL lander equipped with GPS, IMU, camera, altimeter and barometer
- Enhanced visual navigation system of EAGLE by developing software solving the Perspective-n-Point problem

Department of Avionics Systems, German Aerospace Center, Germany 2014 – 2015
Technical Staff [Programming with: C++, C#]

- Designed and operated functional test procedures for [MASCOT](#) (an asteroid lander of Hayabusa 2 launched in 2014)
- Coordinated and supported across team divisions in order to increase MASCOT's system reliability

Chemnitz University of Technology, Germany 2012
Intern Student [Programming with: C++]

- Developed algorithm for 3D point cloud registration from RGBD image sequences using RGBD-ICP algorithm
- Developed software for extracting depth images from stereo camera system

EDUCATION

MSc Computing (Specialism in Artificial Intelligence), Imperial College London, United Kingdom 2013 – 2014

- GPA: 72.7/100 – Distinction
- Research Interest: Mobile Robot Navigation, Computer Vision, Artificial Intelligence
- Research Experience:
 - Cardiac Video Stabilization for Robotic Surgery (Advisor: Prof. Daniel Rueckert) – detail below
 - Simultaneous Localization and Mapping on a Single Camera (Advisor: Prof. Andrew J. Davison)
- Relevant Coursework: Robotics, Advanced Statistical Machine Learning, Computer Vision

BEng Computer Engineering, Chulalongkorn University, Thailand 2009 – 2013

- GPA: 3.86/4.00 – First Class Honours
- Final Year Project : Autonomous Mobile Robot Navigation with a Fisheye Camera – detail below

Deep Learning Nanodegree, Udacity 2018

- Online degree focusing on deep learning using common tools such as tensorflow and keras
- Conducted hands-on projects including image classification with CNN-based architecture and image generation with GAN

PROJECT EXPERIENCE

Evaluation of Deforestation in Thailand from Satellite Images based on Deep Learning Approaches 2019 - Present
Software Developer [Programming with: Python]

- Working with a team from the University (KMUTT, Thailand) developing an algorithm to evaluate deforestation
- Adopting DeepLab deep learning architecture to perform forest semantic segmentation from satellite images

Odometry Estimation from RGBD Image Sequence 2016
Personal Project [Programming with: C++]

- Implemented software to estimate poses of an RGBD camera based on direct image alignment ([code](#), [video](#))

- Cardiac Video Stabilization for Robotic Surgery** 2014
Individual Research Project, Dissertation (Imperial College London) [Programming with: C++, MATLAB]
- Devised a cardiac video stabilization framework to compensate heart motions for laparoscopic robotically-assisted surgery
 - Proposed a novel feature prediction algorithm based on manifold learning to exploit cardiac periodic motions
 - Proposed a novel feature tracking scheme by taking advantages from multiple trackers, resulting in higher precision and convergence rate
- 2D-Laser Scan Registration using Multi-Scale NDT with Polar Scan Clustering** 2013
Individual Research Project [Programming with: C++]
- Improved conventional 2D point cloud registration algorithm by exploiting the angular-sorted property of laser rangefinder
- Autonomous Mobile Robot Navigation with a Fisheye Camera** 2012
Individual Research Project, Final Year Project (Chulalongkorn University) [Programming with: C++]
- Adopted EKF-SLAM algorithm to perform localization and mapping for mobile robots from image sequences ([video](#))
 - Proposed an algorithm to optimize both safety and time consumption in robotic obstacle avoidance ([video](#))
- Thailand Robocup@Home Championship 2011** 2012
Team Leader & Software Developer [Programming with: C++]
- Led the team of 7 to build an autonomous robot to operate in home-like environment
 - Developed a partial filter-based SLAM algorithm for mobile robots using measurement from laser rangefinder
 - Developed a Kalman filter-based software for human following problem
 - Achieved 3rd Rank overall (Highest score in human following task and second highest score in navigation task)
- Embedded Development Microsoft Imagine Cup 2011** 2011
Team Leader & Software Developer [Programming with: C#]
- Led the team of 3 to develop a device to recognize traffic condition in real time using a microphone successfully
 - Initiated a feature-based supervised learning algorithm to map sound signals to their corresponding traffic conditions
- Thailand Embedded Product Award** 2010
Software Developer [Programming with: C#]
- Worked in a group of 3 to develop Blind Board to display text files to the blind successfully

AWARDS AND ACHIEVEMENTS

- 2nd place in the 2013 IEEE Thailand Student Conference on Senior Capstone Project
- Top 5% in the Stanford online class of Introduction to Artificial Intelligence 2011
- 4th place in the 2011 ACM-ICPC Thailand National Programming Contest
- Qualified into the final round of YSC (Young Science Competition) with the project “Conformational Analysis of Pseudo-Peptide Bonds Using DFT and ab Initio Calculations” in 2008
- Silver medal in the 4th Thailand POSN Mathematical Olympiad 2007
- 1st place in the 2nd Scientific E-learning Game Development Competition KMUTT WAKEUP in 2007

PUBLICATIONS

- M. Dumke, M. Sagliano, P. Saranrittichai, G. F. Trigo, S. Theil “EAGLE - Environment for Autonomous GNC Landing Experiments,” International ESA Conference on Guidance, Navigation and Control Systems, Salzburg, Austria, 2017.
- P. Saranrittichai, N. Niparnan, A. Sudsang “2D-Laser Scan Registration using Multi-Scale NDT with Polar Scan Clustering,” International Conference on Electronics, Mechatronics and Automation, Singapore, August, 2013. ([link](#))
- P. Saranrittichai, N. Niparnan, A. Sudsang “Robust Local Obstacle Avoidance for Mobile Robot based on Dynamic Window Approach,” International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, Krabi, Thailand, May, 2013. ([link](#))
- P. Saranrittichai, S. Sattaratnamai, A. Sudsang, N. Niparnan “Simultaneous Localization and Mapping using Particle Filter with Single Map,” Thailand Robot Society Conference on Robotics and Industrial Technology, Nakhon Pathom, Thailand, Nov, 2012.
- P. Saranrittichai, T. Wilaiprasitporn and W. Pattara-Atikom, “Assessing Traffic Condition Using Acoustic Sound with Feature Based Approach,” Thailand-Japan International Academic Conference, Tokyo, Japan, Nov, 2011.

ADDITIONAL EXPERIENCE

Asian Students Collaboration Encouragement Program in Technology, Japan 2013

Participant (A Thai representative to join the program under the theme “Robot Technology linking Human and Machine”)

- Participated in [ASCENT](#) workshops conducted by TIT Laboratories and Japanese Companies (Hitachi, AIST)
- Constructed ideas related to robot applications with the colleagues from different countries

Member of Robotic Club, Chulalongkorn University, Thailand 2009 – 2013

Club member (Software Developer)

- Exchanged the knowledge in the field of robotics among club members
- Collaborated with other members to develop robotic projects for researches and competitions

RELEVANT SKILLS

Computer & IT Skills

- Programming Languages: C++, Python, Java
- Programming Tools: MATLAB, Simulink, Git, Mercurial, SVN, OpenCV, OpenGL, Tensorflow, Keras
- Operating Systems: Windows, Linux