DINESH ATCHUTHAN | R&D Perception Engineer

a.dinesh@hotmail.fr • 10 R. L. A. de Bougainville, 31400, Toulouse • (+33)6 51 76 91 97

GitHub • LinkedIn • Web Page

Experience (Research & Industry)

R&D Perception Engineer
November 2019–Present

EasyMile
Toulouse, France

I contributed to the Perception stack (terrain model estimation, obstacle detection, pointcloud filtering) for autonomous platforms.
Lidar in Degraded Visual Environment (DVE): Assistance in thesis supervision (Lidar Perception and weather inference). Platform performance evaluation (noise filtering and obstacle detection).
I Started exploring Random Finite Sets based methods.

Lidar Pointcloud | CUDA | Occupancy Grids | Statistics | Degraded Weather

Postdoctoral Researcher
November 2018–Jan 2019

LAAS-CNRS
Toulouse, France

Visual-inertial state estimation using fiducial markers (Apriltags).
I implemented the fiducial marker based SLAM method in WOLF (C++ framework) based on a factor-graph formulation.

Apriltags | SLAM | Sensor Calibration | Camera | IMU | Sensors Synchronization

PhD Student
October 2015–September 2018

LAAS-CNRS
Toulouse, France

I developed an inertial estimation method taking advantage of the Lie Theory to provide real-time state estimates.
I also participated to the development of a c++ framework (WOLF) designed to solve SLAM problems using factor graphs.
Thesis ("Towards new sensing capabilities for legged robots using low-cost IMU") defended on October 23rd 2018.

IMU Preintegration Theory | Factor Graphs | Optimization methods | Lie Theory

Intern
March 2015–September 2015

LAAS-CNRS
Toulouse, France

I worked on a person localization and tracking method using a Kinect sensor.
The person detection was based on RGB images while the tracking part used depth data.
I investigated the use of machine learning methods (SVM / random tree) for both classification and pose estimation of detected people (Python - scikit).

Tracking | Particle Filter | Machine Learning | Classification | RGBD Data | PCA

Imaging and Software Development Intern
June 2014–September 2014

Institute of Biomedical Engineering - Prince of Songkla Univeristy
Songkla, Thailand

I created a software allowing the doctors to process and exploit (manual and automatic region segmentation) CT-scans. I also developed an Android application using augmented reality to help customers choose the right orthopaedic insole.

Region Growing | Matlab | Android Application Development | Augmented Reality

Education

Coursera: Deep Learning Specialization
2022

Online course certificates
Build and train neural network architectures; use regularization & initialization methods; use different optimization algorithms; hyperparameters tuning, ML Strategy definition, Error Analysis, Transfer / Multi-task learning; Structuring ML Projects; Convolutional Neural Networks

Coursera: Decentralized Finance
2022

Online course certificates
Analysis of DeFi infrastructure, blockchain mechanics, supply and ownership, loans and swaps. Explored leading DeFi protocols. Introduction to risks related to DeFi.

MULTI-OBJECT TRACKING FOR AUTOMOTIVE SYSTEMS — on-going

Online courses
Completed Single Object Tracking, Random Finite Sets courses.
Yet to complete: N Known Object Tracking Multiple Object Tracking

TELECOM PHYSIQUE STRASBOURG — 2012–2015

Engineering degree — Strasbourg, France
Imaging, Robotics and Biomedical Engineering (IRIV master degree)
Surgical and Medical Robotics (IRMC master degree)

Skills

PROGRAMMING LANGUAGE **Experienced:** C | C++ **Familiar:** Python | Java | Solidity **Notions:** Rust
FRAMEWORKS & TOOLS ROS | Git | CUDA | Matlab | Linux | Tensorflow
LANGUAGES **Native:** French **Fluent:** English (TOEIC: score 920 · June 2014)
Familiar: Tamoul | German **Notions:** Japanese

Extracurricular activities

learn crypto through programming (educational purposes, not maintained) :

- WavePortal: a Web3 version of twitter on the Ethereum blockchain.
  Solidity | Smart Contract | Testnet Deployment | Connection to Wallet | React
- Creation of a NFT collection on the Ethereum blockchain. Visualize the NFT on OpenSea.
  NFT Creation | Minting
- Creation of a NFT game. Dive deeper in the use of NFTs on blockchain and creation of a web app.
  Holding Dynamic Data | Events | Web App
- GifPortal: A Solana program and a web app for anyone to submit Gifs.
  Program Deployment (Devnet) | Connect to Phantom Wallet | Rust

: daily sport practice. Practicing with a friend helps me to push my limits and feel better.

: reading fantasy books : occasionally playing board / cooperative video games

Publications

[1] Dinesh Atchuthan. Towards new sensing capabilities for legged locomotion using real-time state estimation with low-cost IMUs. PhD thesis, 2018. Thèse de doctorat dirigée par Mansard, Nicolas et Solà Ortega, Joan Robotique Toulouse 3 2018.

[2] Dinesh Atchuthan, Angel Santamaria-Navarro, Nicolas Mansard, Olivier Stasse, and Joan Solà. Odometry Based on Auto-Calibrating Inertial Measurement Unit Attached to the Feet. In European Control Conference (ECC 2018), page 8p., Limassol, Cyprus, June 2018. KIOS Research and Innovation Center of Excellence.

[3] Mederic Fourmy, Dinesh Atchuthan, Nicolas Mansard, Joan Sola, and Thomas Flayols. Absolute humanoid localization and mapping based on IMU Lie group and fiducial markers. In IEEE-RAS 19th International Conference on Humanoid Robots (Humanoids 2019), Toronto, Canada, October 2019.

[4] Karl Montalban, Christophe Reymann, Dinesh Atchuthan, Paul-Edouard Dupouy, Nicolas Riviere, and Simon Lacroix. A quantitative analysis of point clouds from automotive lidars exposed to artificial rain and fog. Atmosphere, 12(6):738, June 2021.

[5] Joan Sola, Joan Vallve, Joaquim Casals, Jeremie Deray, Mederic Fourmy, Dinesh Atchuthan, Andreu Corominas-Murtra, and Juan Andrade-Cetto. Wolf: A modular estimation framework for robotics based on factor graphs, 2021.

[6] Joan Solà, Jeremie Deray, and Dinesh Atchuthan. A micro lie theory for state estimation in robotics, 2018.