MANAS CHAUDHARI

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EDUCATION

B.Tech & M.Tech, Indian Institute of Technology, Bombay June 2009 - July 2014
Major: Energy Systems Engineering
Minor: Electrical Engineering
Cumulative Performance Index(CPI): **9.04 on a scale of 10**

TECHNICAL STRENGTHS

Computer Languages	Python, C++, Java, Kotlin, Objective C, Swift, Shell Script, Ruby, C#
Libraries	OpenCV, ROS, Gazebo
Tools & Frameworks	Matlab, Scilab, LabVIEW, Intel SSE, Rails, WPF, Backbone
App Platforms	iOS, Android, Windows Phone, Web

WORK EXPERIENCE

Software Development, *TinyOwl*
Engineering Manager *September 2015 - Present*
iOS, Android Lead *June 2014 - September 2015*

- Developed and maintained TinyOwl's Android and iOS apps. Responsible for architecture of various modules: database access, networking, data sync with server
- Lead a full stack team of 6 developers, driving the Magical Fridge product, which involved heavy personalization. Achieved stable weekly releases, by following Scrum & using feature toggles
- Developed patterns to improve development speed and stability
  - Integrated Functional Reactive Programming libraries (RxJava, RxSwift) to simplify pages with many dependent interactions
  - Practised MVVM pattern with RxJava and Data Binding to improve code reuse
  - Kotlin language to eliminate null pointer exceptions and extension based programming to allow code reuse without inheritance
- Contributed to internal web panels, based on Backbone and server side, based on Ruby on Rails

RESEARCH EXPERIENCE

Energy Optimal Path Planning for Mobile Robots July 2013 - July 2014
Dual Degree Dissertation *C++, ROS, Gazebo*

- Developed a new technique for determining energy optimal trajectories based on Dubins curves, achieving linear time complexity & 14.8% more average energy savings than existing methods
- Improved waypoint selection by enhancing A* and Theta* techniques for finding optimum solutions with turn based cost functions
- Implemented path planning in C++ using ROS and simulation in Gazebo

Intelligent Ground Vehicle Competition December 2012 - June 2014
Oakland University, Michigan, US *C++, LabVIEW, ROS*

- Secured 7th position worldwide out of 52 teams
- Built an autonomous ground vehicle Pushpak 2 capable of navigating through an outdoor obstacle course by detecting lines, obstructions and following GPS waypoints
- Programmed the communication component based on Joint Architecture for Unmanned Systems (JAUS) using C++ and LabVIEW, enabling communication with other JAUS compliant unmanned systems
- Implemented global map generation by merging laser scan data of obstacles and white lines detected by image processing component

Autonomous Dancing Hexapod September - November 2012
CS684 Embedded Systems Course Project *C, Android, Bluetooth*

- Programmed a hexapod to perform six different dance moves in synchronization with the beats detected in music
- Major challenge involved planning dance moves based on beat patterns, considering aesthetics and constraints in motion
- The implementation involved an Android device for selecting the music track which communicated with the Firebird V hexapod using bluetooth

INTERNSHIPS

Parallel Programming May - July 2013
Institut dElectronique Fondamentale, Universite Paris Sud, France *C++, SIMD, OpenCV*

- Accelerated the image processing code using Single Instruction Multiple Data instruction (SIMD) set which enables performing a vector data operation in single instruction
- Implemented code for performing data swizzling to convert OpenCV image structure into a matrix of 32-bit single precision real vectors
- Achieved 105x acceleration for certain functions and 10x acceleration overall

Covariance Tracking May - July 2012
Institut dElectronique Fondamentale, Universite Paris Sud, France *C++*

- Implemented tracking of a colored non-rigid object from an image sequence using the Covariance Tracking algorithm
- Technique adopted in the European project SPY for intelligent surveillance to assist in law enforcement
- Achieved successful tracking in challenging datasets, also reducing computation, by using only the best discriminating features based on variance ratios
- Implemented calculation of covariance matrices using integral images, which reduced computations by 45% by avoiding repeated computations at the expense of extra memory usage

RELEVANT COURSES

Computer Vision
Embedded Systems
Probability and Random Processes
Digital Electronics
Control and Communication
Motion Planning and Coordination of Autonomous Vehicles
Operating Systems
Microprocessor Applications in Power Electronics
Signals and Systems
Analog Electronics
Communication Networks