Medhat Omr

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INTERESTS	Machine Learning (Statistical methods, and Deep Learning), Data Science and Big Data, Self-Driving Cars related skills such as Localization, Control, Path Planning, Navigation, and Computer Vision.

EDUCATION

Queen's University, Kingston, ON, Canada.   Sep 2011 – Mar 2015

Ph.D. in Electrical & Computer Engineering   GPA 4.15
- Advisor: Prof. Aboelmagd Noureldin

Ain Shams University, Cairo, Egypt.   Sep 2003 – Jun 2008

B.Sc. in Computer & Systems Engineering   GPA 3.95/4
- Class rank: 3 of 140

EXPERIENCE

TDK, Canada

Staff Algorithm Engineer, Navigation R&D   Oct 2017 – Present
- Products: T-PN ME, CoursaSports, and Driving Navigation related R&D project
- In addition to the products above, I also build and maintain helping tools mainly written in C++14, and Python

Sr. Software Algorithm Designer, Navigation R&D   Apr 2015 – Sep 2017
- Products: CoursaSports
- In addition to the product above, I also built one internal library from scratch in C, and rewrite another big library from C into C++14 for another application

Software Algorithm Designer, Navigation R&D   Jun 2012 – Mar 2015
- Products: T-PN ME
- Some tasks that I did in T-PN ME include:
  - **Algorithms Development** including collecting data, performing data wrangling, visualization, and analysis. In addition to developing and testing code in MATLAB
  - **T-PN (ME) Integration** involving converting MATLAB code into C and integrate it into T-PN (ME), then test the integrated system on the initial data set.
  - **Algorithms Verification** through Deployment on one or more consumer devices, and test system on a wider users and devices base.
- For more details, please see Chapter 3 of my Ph.D. thesis in this [link] on what was my rule in T-PN ME product line

ONLINE EDUCATION

Udacity, Self-Driving Car Engineer Online Nanodegree   Jan 2017 – Jan 2018

Over 15 projects in one year
- Using deep learning to solve Traffic Sign Classification, and Driver Behaviour Cloning problems
- Using Computer Vision to implement an Advanced Lane Detection
- Using Machine Learning algorithms such as SVM, Decision Trees, and Ensemble Learning to solve Vehicle Tracking problem
- Implement a complete library in C++ for Extended Kalman Filter, Unscented Kalman Filter, and Particle Filter
- Control a vehicle to move it on a path in a simulation environment using PID Controller and Model-Predictive Controller (MPC)
- Implementing a Highway Path Planner involving Environmental Prediction, Behavior Planning, and Trajectory Generation
- Implementing Semantic Segmentation using Fully Convolutional Networks, Scene Understanding, and Inference Optimizations

COMPUTER SKILLS

Languages: C, C++11, Python, and MATLAB
Libraries: Scikit-learn, OpenCV, Keras, Tensorflow, TensorFlow Object Detection API, and PyTorch
Other Tools/Services: Git, GitHub, CMake, and AWS

PUBLICATIONS

PATENTS

[1] Inventors: J. Georgy, Y. Li, **M. Omr** C. Goodall, H. Chang, Assignee: Invensense Inc., "Method and system for multiple pass smoothing", Patent US9719787B2, Issued: Aug 1, 2017.

[2] Inventors: **M. Omr**, J. Georgy, ad A. Noureldin, Assignee: Invensense Inc., "Method and System for Characterization of on Foot Motion with Multiple Sensor Assemblies", Provisional Patent U.S. Serial No. 14/617,743, filing date: 9 February 2015.

[3] Inventors: **M. Omr**, J. Georgy, and A. Noureldin, Assignee: Trusted Positioning Inc., "Method and Apparatus for Enhanced Navigation with Multiple Sensor Assemblies", PCT application, International Application No. PCT/CA2014/000698, filing date: 17 September 2014 (priority by Provisional Patent U.S. Serial No. 61/878,952, filing date: 17 September 2013).

[4] Inventors: J. Georgy, **M. Omr**, and A. Noureldin, Assignee: Trusted Positioning Inc., "Method and Apparatus for Determination of Misalignment between Device and Vessel Using Radius of Rotation", PCT application, International Application No. PCT/CA2014/000670, filing date: 8 September 2015 (priority by Provisional patent U.S. Serial No. 61/878,336, filing date: 16 September 2013).

[5] Inventors: **M. Omr**, A. Wahdan, J. Georgy, and A. Noureldin, Assignee: Trusted Positioning Inc., "Method and Apparatus for Varying Step Length Estimation Using Nonlinear System Identification", U.S. Serial No. 14/764,519, filing date: 29 July 2015; PCT application, International Application No. PCT/CA2014/000060, filing date: 30 January 2014 (priority by Provisional patent U.S. Serial No. 61/759,522, filing date: 1 February 2013).

JOURNALS

[1] **M. Omr**, J. Georgy, and A. Noureldin, "Using Multiple Portable/Wearable Devices for Enhanced Misalignment Estimation in Portable Navigation," *GPS Solutions, Springer*, vol. 21, no. 2, pp. 393–404, Apr 2017.

CONFERENCES

[1] **M. Omr**, J. Georgy, A. Noureldin, "Using Multiple Sensor Triads for Enhancing the Navigation Solution of Portable and Wearable Devices," in *ION GNSS+ 2013*, Nashville, USA, Sep 2013.

[2] A. Wahdan, **M. Omr**, J. Georgy, A. Noureldin, "Varying Step Length Estimation Using Nonlinear System Identification," in *ION GNSS+ 2013*, Nashville, USA, Sep 2013.

[3] **M. Omr**, J. Georgy, A. Noureldin, "Using Multiple Sensor Triads for Enhancing the Misalignment Estimation of a Navigation Solution of Portable and Wearable Devices," in *IEEE/ION PLANS 2014*, California, USA, May 2014.

[4] **M. Omr**, J. Georgy, W. Abdelfatah, D. Auld, and Z. Shen, "T-PN ME: An Enhanced Real-Time Indoor/Outdoor Navigation System Using Multiple Portable/Wearable Devices," in *ION GNSS+ 2014*, Tampa, USA, Sep 2014.

[5] A. S. Ali, **M. Omr**, A. Al-Hamad, J. Georgy, "Portable Real-time Indoor/Outdoor Navigation for Runners using Smart Devices," in *ION GNSS+ 2014*, Tampa, USA, Sep 2014.

AWARDS & HONORS

- Mitacs and NSRC Awards, Electrical and Computer Engineering, Queens University   2012 – 2015
  For successfully doing research in partnership with an industrial partner.

- 200% working hours Award, Computer and Systems Engineering, Ain Shams University   May 2010
  for outstanding achievement as a Teaching Assistant

- Promoted from Private to Corporal Rank, Egyptian Military Forces,   Jan 2010
  for developing a data-driven application (using C# and MS SQL) besides my normal duties as a soldier during my compulsory military service