

Islam AlaaEldin Mustafa Ali

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Objective

A dedicated and detail-oriented research and development engineer aspiring a challenging internship in the field of **Inertial/Visual Perception and Autonomous Systems**. Possess a considerable research and professional experience in working and leading highly innovative projects in fast-paced environments and with multi-disciplinary teams.

Education and Academic Records

- Ph.D.: UNIVERSITY OF ALBERTA, Edmonton, Alberta, Canada** **Sept. 2019 – Present**
- Department of Computing Science
 - Under the supervision of Prof. Hong Zhang
- M.Sc.: CAIRO UNIVERSITY, Cairo, Egypt** **Mar. 2014 – May 2018**
- Computer Engineering, **Cumulative GPA: 3.6 / 4.0**
 - Thesis: *“Towards a Non-Aided Monocular Visual Odometry System”*.
- B.Sc.: CAIRO UNIVERSITY, Cairo, Egypt** **Sept. 2008 – May 2013**
- Computer Engineering, **Very Good with Honor Degree (82.23 %), Rank: 7th/72.**
 - Graduation Project: *“Design and Implementation of a General Purpose Digital Signal Processor”*, **Grade: Distinction (98.5%) - highest grade in class, best graduation book.**
 - Cairo University Undergraduate Distinguished Students’ Award (2008-2013).

Publications

Refereed Conference Papers

- [1] Islam Alaa, Amr Wassal, *“VO-Sim: A Generic Framework for Tuning and Evaluating Visual Odometry Systems”*, in the proceedings of *IEEE/ION Position, Location, and Navigation Symposium (PLANS 2018)*, Monterey, CA, April 2018, pp. 432-439.
- [2] Islam Alaa, Amr Wassal, Omar Rayan, Osama Rashad, Amr Eldieb, *“A Dual-Channel CAMShift Algorithm for Embedded Real-Time Visual Servoing Applications”*, in the proceedings of the *10th International Conference on Mobile Mapping Technology (MMT)*, May 2017, pp 42-47
- [3] Mostafa Mahmoud, Islam Alaa, Amr Wassal, Aboelmagd Noureldin, Amr Eldieb, *“Tuning of The Error Covariance Parameters in EKF-Based INS/GPS Systems: A Practical Approach”*, in the proceedings of the *10th International Conference on Mobile Mapping Technology (MMT)*, May 2017, pp 112-117
- [4] Ayman Ismail, Khaled Ashraf, Ahmed Metawea, Islam Mostfa, Ahmed Saeed, Eslam Helal, Mostafa Essawy, Mohamed Abdelazim, Mostafa Ibrahim, Ramy Raafat, Eslam Abdelbary, Islam Alaa, Marawan Nabil, Abdelrahman Mansour, Bassem Ibrahim, Ayman Elsayed, *“A High-Performance Self-Clocked Digital-Output Quartz Gyroscope”*, In the proceedings of *IEEE Sensors Conference, 2015.*

Provisional Patent Applications

- [1] Islam Alaa, Amr Wassal, *“Multi-Rate Algorithm for Visual Odometry”*, U.S. Provisional Patent Ser. No. 62/631767, filed *February 17, 2018.*

Professional Experience

UNIVERSITY OF ALBERTA, Edmonton, Alberta, Canada

Graduate Research/Teaching Assistant, Department of Computing Science

Sept. 2019 – Present

- Conducting research at the **Robotics\Vision Lab** on visual inertial odometry algorithms design and optimization.
- Teaching assistant of undergraduate course at the department of computing science.
 - *Course Taught:* (Fall 2019) CMPUT 429 – Computer Systems and Architecture.

SI-WARE SYSTEMS, Cairo, Egypt

Staff Design Engineer, Systems Design Group

April 2018 – Aug. 2019

Senior Design Engineer, Systems Design Group

April 2016 – April 2018

- Full design, modeling, implementation, and testing of an orientation estimation algorithm based on inertial sensing and using cascaded Extended Kalman Filters for inertial stabilization platforms.
- Contribution in formulating and deploying a multi-core bare-metal architecture for real-time applications.
- Innovating a novel inter-board communication protocol with handshaking and framing capabilities.
- Complete HW/SW design of a visual tracking system and its integration with an inertial stabilization platform.
- Successful definition, execution, and leading projects' deployment plans at international customers' sites.

SI-WARE SYSTEMS, Cairo, Egypt

Digital IC Design Engineer, Digital Design Group

Aug. 2013 – April 2016

- Contribution in the design and development of seven highly innovative sensors' ASIC interfacing tape-out.
 - Multi-axis ASIC interface for inertial/piezo-electric/gas-flow sensing devices and on-chip microcontrollers.
- Definition, design, modeling, implementation, integration, and testing of a wide spectrum of digital blocks.
 - Communication interfaces, digital filtering blocks, IMU errors compensation.

vWorker.com / Freelancer.com, Online

Freelance Software Engineer

Sept. 2011 – Nov. 2012

- Ranked as Top Worker for efficiently completing over 32 projects covering a wide range of technologies.

Private Contractor, Cairo, Egypt

Part-time Software Engineer

Aug. 2011 – Sept. 2011

- Worked on three enterprise-level web apps covering the full pipeline of software engineering.

Technical Skills

- **Embedded Systems:** Microcontrollers, ARM-based development, Multi-core architecture, Bare-metal dev.
- **Image Processing/Computer Vision:** *Libraries:* OpenCV, OpenGL, Eigen, *Tools:* Matlab, Visual Studio, Eclipse, *Platforms:* Windows, Linux, *Toolboxes:* Matlab Camera Calibration, Caltech Calibration toolbox, Matlab Computer Vision toolbox, *Techniques:* Visual Tracking, Visual Servoing, Feature-based Vision, Monocular Visual Odometry, Object Detection and Classification, Image Filtering.
- **Communication Protocols:** I2C, SPI, UART, RS232, Bluetooth, ZigBee
- **Sensors Interfacing:** Gyroscope, Accelerometer, Magnetic sensors, GPS, laser-range finder
- **Digital Design and VLSI:** Verilog/VHDL, Verification, Synthesis and post-synthesis Simulations.
- **Digital Design Tools/Software:** ModelSim/Quarta, Design Compiler, RC compiler, Xilinx ISE/Vivado.
- **Programming Languages:** C, Embedded C, C++, C#, Java SE, Java EE, Python, Perl, TCL, Java for Android.

Research Interests

- Inertial/Visual Perception systems and Control
- Optimal Estimation and Sensor Fusion
- Real-time Embedded Systems
- Monocular / Stereo Visual Odometry and SLAM

Extracurricular Activities

- **(2016) Supervisor/Coach and co-product owner**, LDLSP project, Boot-up program funded by TIEC.
- **(2014 - 2016) Advisor/Coach**, Undergraduate graduation projects in robotics, vision, VLSI, computer architecture.
- **(2012) IP**, Innovation Planet, Contributed as an Embedded Systems instructor and designer.
- **(2011-2012) CCEL**, Cairo Computer Engineering Lab, Embedded systems instructor.
- **(2010-2012) IEEE-CUSB**, Institute of Electrical and Electronics Engineers – Cairo University Student Branch
- **(2009-2011) UniMasr.com**, Online Student Community
- **(2010-2011) IEEEExtreme**, 24-hours programming contest/challenge.
- **(2009) Computer Engineering Annual Student Conference**, Head of Organizing Committee.

Language Skills

- **Arabic:** Native tongue.
- **English:** Excellent, *IELTS score:* 8/9 – L: 9/9, R: 8/9, W: 7/9, S: 7/9 – *CEFR Level:* C1.