Tarek Dief

AIRPLANE DEVELOPMENT ENGINEER, PDAS LTD.COMPANY, JAPAN • CONTROL EXPERT

Male • July 6, 1990 • Edmonton, Canada

📱 (+1) 587-921-3179 | ✉ na3emtarek@gmail.com | 🏠 www.pdas.co.jp , https://www.ncbl.ualberta.ca/tarek-dief | 💼 Tarek Dief

Summary 💬

- Specialized in system modelling, and simulation.
- Skilled in system analysis, control design, algorithm implementation, and testing.
- Well-trained engineer in system troubleshooting, hardware setup, and software systems.
- Leading author for 18 journal/conference papers (see LinkedIn profile for detailed list of publications)
- More details of my previous projects are available in my portfolio: https://tarekdief.github.io/TarekD_Portfolio/

Work Experience ⚙

University of Alberta, Nanotechnology Research Centre   *Edmonton, Canada*

Postdoctoral Fellow (**FULL TIME**): REMOTE HEALTH MONITORING AND REHABILITATION OF PATIENTS WITH NEUROLOGICAL CONDITIONS TO MINIMIZE THE RISK OF COVID-19 SPREAD IN CANADIAN HOSPITALS   *August 2020- present*

- Develop algorithms to 1) identify different components of daily activity (e.g., lying, sitting, standing, walking, running, stair climbing/descending) of those with MS injuries in the community, 2) characterize sitting and standing balance of MS patients.
- Develop a feedback-based technology to recommend patients to behaviour change to minimize the MS-related symptom when detected.
- Implement the developed technology in the real world to investigate the validity and suitability of the developed wearable technology.
- Fine-tune and finalize the first prototype of the developed technology as a user-friendly technology that can be adopted by the patients and healthcare provider with minimal training.

PD Aerospace company, LTD, Japan   *Aichi, Japan*
                                    March 2020- Aug. 2020, **present**
Airplane development engineer (**FULL-TIME**)   **(On-leave)**

- Design and develop algorithms required for airplane-X06 control system
- Integrate, validate and test X06 software and electronic components.
- Design, support and conduct X06 flight tests.

Kyushu University, RIAM   *Fukuoka, Japan*

Postdoctoral Fellow (**FULL TIME**)   *Oct 2017- March 2020*
- Design and built the kite control unit (KCU) for stabilizing the kite during flight.
- Model and simulate model for variable-tether-length system.
- Build a measurement unit and wireless communication system to measure the kite's position and attitude then send these data to the ground station.

Skills ⓘ

Languages	Python, C++/C, MatLab/Simulink/GUI, Maple.
Platforms, Framework	2-D AutoCAD, SolidWorks (3D Modelling), LabVIEW, ROS, Nastran.
Programming IDE & Tools	Arduino,STM32, Mbed, PyCharm, Bitbucket, Atom.
Motion capture system	Nexus Vicon
Operating Systems	Linux, Windows.
Project planning:	Easy RedMine, Asana.
Autopilot systms	Embention Autopilot (Veronte software), X-Plane 11.
Reporting and presenting software:	Microsoft (Word, Excel, PowerPoint), Latex (beamer, Texword).
Photo and Video Editing:	Photoshop, VSDC.

Projects 📈

1- Kite Power System An Airborne Wind Energy System (AWEs) utilizing the wind to generate power using kites. It consists of inflatable kite that flies in Figure-of-Eight motion with control algorithm to harvest the optimal power from the lifting force comes from the kite. **The main tasks achieved are as follows:**

- Derived and implement a mathematical model for the kite using Matlab.
- Applied a system identification (SI) algorithm to identify the kite dynamics in real time.
- Designed and implemented different control algorithms then validate the results with different mathematical models for the kite.
- Built a full system from scratch including the measurement unit, ground station and the Kite Control Unit (KCU).
- Developed a hardware-in-the-Loop system (HILs) to steer the kite motion.
- Performed kite flight tests and data post-processing.

2- SKYPULL Power System An Airborne Wind Energy System (AWEs) utilizing the wind to generate power using fixed wing drones. It consists of a rigid body drone that flies in Figure-of-Eight motion with control algorithm to harvest the optimal power from the lifting force comes from the wings. **The main tasks achieved are as follows**:
- Derive and implement a mathematical model for the drone using Matlab & ROS.
- Develop a control algorithm to perform the Flight-Path to generate the optimal power during flying.

3- Quadrotor UAV A drone consists of four rotors and have several applications using light-weight sensors.
The main tasks achieved are as follows:
- Derived and implemented a mathematical model for the quad-rotor dynamics, then designed control algorithms to stabilize the attitude and altitude for the indoor and outdoor flights.
- Built a Hardware-in-the-Loop system (HILs) including the set-up for Micro-Controller, MEMS, motros, Lidar, sonar, wireless systems, etc..
- Performed flight tests and data post-processing.

4- CanSat An Educational Nanosatellite microcontroller project utilizing various sensors, actuators, transmitters, and receivers. It consists of two Microcontrollers communicating through radio transmissions from the satellite to a ground station. The satellite collects temperature, humidity, pressure, geolocation, acceleration and orientation measurements, stores it onto an SD card, and then sent to the ground station where data was processed and visualized in a dashboard built with LabVIEW. A PCB board was designed and manufactured to electrically connect the sensors and electric components of the device. I also wrote an Arduino Library to interface with the GPS module.

Education 🎓

Kyushu University *Fukuoka, Japan*
DOCTOR OF PHILOSOPHY PH.D., INTERDISCIPLINARY GRADUATE SCHOOL OF ENGINEERING SCIENCES (IGSES) *Oct 2014 - Sep 2017*
- **Concentration**: Adaptive Flight-Path Control of Kite Power System.

Cairo University *Cairo, Egypt*
MASTER OF SCIENCE M.SC., AERONAUTICAL AND AEROSPACE ENGINEERING. *Sep 2012 - Sep 2014*
- **Concentration**: Design And Manufacturing of Quad-Rotor with Autopilot.

Cairo University *Cairo, Egypt*
BACHELOR OF SCIENCE B.SC., AERONAUTICAL AND AEROSPACE ENGINEERING. *Sep 2007 - July 2012*
- **Concentration**: Control and System Dynamics.

Research Interest/Industrial Knoweledge 🔍

Robotics, Bio-mechanics, Autonomous Drones, Airborne Systems, Control System Design, Avionics, Embedded System, Manufacturing and Testing, Thermodynamics, Fluid Mechanics, Heat Transfer, and Stress Analysis.

Languages 🈯

Arabic: **Native Tongue**, English: **Advanced**, Japanese: **Basic**

Interests & hobbies ◐

Travelling, Swimming, Soccer, Fishing, Horsing, and Hunting