Olalekan Ogunmolu

Robotics | Control Systems | AI

Rerum Cognoscere Causas: To know the causes of things.

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Education

2014–Present **PhD in Electrical Engineering** , *University of Texas at Dallas*, Richardson, United States.
Advisor: Prof. Nick Gans. Design and prototype of a medical soft robot for automated patient positioning during cancer radiotherapy.

2011–2012 **Master of Science in Engineering in Control Systems**, *The University of Sheffield*, Sheffield, United Kingdom.
Advisor: Prof. Tony J. Dodd. Thesis: "Autonomous Navigation of a Rotorcraft Unmanned Aerial Vehicle using Machine Vision." | Committee Members: Drs. George Panoutsos and Robin Pursehouse. | Dissertation reviewed by Prof. Mahdi Mahfouf.

2000–2005 **Bachelor Of Science in Physics & Electronics**, *Adekunle Ajasin University*, Akungba, Nigeria.
Senior thesis advised by Prof. Ademola Amusa (*MS, Columbia University, PhD UIUC*).| Dissertation Grade: 85% ≡ A+ | Graduated Magna Cum Laude.

Experience

Research

Summer '17 **Research Assistant**, Dr. Tyler Summers, Mechanical Engineering, UT Dallas.
Dynamic Programming, Decision Theoretic Control, Machine/Reinforcement Learning.

Fall '14 - Present **Research Assistant**, Dr. Nick Gans, Electrical Engineering, University of Texas at Dallas.
Control Systems, Systems Identification, State Estimation and Computer Vision.

Summer '16 **Hardware Integration Intern**, Amazon Robotics LLC. Dr. Tye Brady (CTO).
SLAM, Software and Hardware Integration.

Spring '16 **Hardware Integration Intern**, Advanced Robotics Lab, Amazon Robotics LLC. Dr. Andy Stubbs (Sr. Systems Manager).
Computer Vision, Hardware Integration.

Teaching

Fall '14 - '16 **Teaching Assistant, Introduction to Robotics**, *University of Texas at Dallas*.
Guided students during laboratories in programming the Robai Cyton 300R2 Robot and graded homeworks.

Spring '15 **Teaching Assistant, Linear Systems (M.S. Class)**, *University of Texas at Dallas*.
Responsible for helping Masters students with linear control theory applications; graded homeworks and midterms.

Spring '14 **Instructor, Analysis and Design of Digital Systems**, *Adekunle Ajasin University*.
Developed course modules, sole instructor for sophomore students, graded homeworks, designed and graded exams.

Summer '14 **Instructor, Digital Logic Design**, *Adekunle Ajasin University*.
Co-developed course modules, joint-instructor for junior students, graded homeworks, designed and graded exams.

Miscellaneous

2009–2011 **Warehouse Manager, Apapa Plant**, *Coca-Cola Hellenic Bottling Company Plc*, Lagos.

2007–2008 **Banking Assistant**, *First Bank of Nigeria Plc*, Lagos.

2005–2007 **System Engineer**, *DMT Technologies Limited*, KD, Nigeria.

Publications

Peer-Reviewed

Olalekan Ogunmolu, Adwait Kulkarn, Yonas Tadesse, Xuejun Gu, Steve Jiang, and Nick Gans. A 3-DOF Neuro-Adaptive Pose Correction System For Frameless and Maskless Cancer Radiotherapy. *IEEE/RSJ International Conference on Robots and Systems* (*IROS 2017*), Vancouver, BC, Canada. September 2017.

Olalekan Ogunmolu, Xuejun Gu, Steve Jiang, and Nick Gans. Vision-based control of a soft-robot for Maskless Cancer Radiotherapy. *IEEE Conference on Automation Science and Engineering (CASE)*, Fort-Worth, Texas, August 2016. DOI: 10.1109/CoASE.2016.7743378

Olalekan Ogunmolu, Xuejun Gu, Steve Jiang, and Nick Gans. A Real-Time Soft-Robotic Patient Positioning System for Maskless Head-and-Neck Cancer Radiotherapy. *IEEE Conference on Automation Science and Engineering (CASE)*, Gothenburg, Sweden, August 2015. DOI: 10.1109/CoASE.2015.7294318

Olalekan Ogunmolu, Nick Gans, Steve Jiang, Xuejun Gu. An Image-Guided Soft Robotic Patient Positioning System for Maskless Head-And-Neck Cancer Radiotherapy: A Proof-of-Concept Study. *American Association of Physicists in Medicine (AAPM)* Annual Meeting, July 2015.

Olalekan Ogunmolu, Autonomous Navigation of a Rotor-craft unmanned aerial vehicle using machine vision. .
MS Thesis, August. 2011. Advisor: Tony J. Dodd, University of Sheffield, England.

Olalekan Ogunmolu, Single Fractional Parentage Coefficients in the sd-Shell Nuclei .
BS Thesis, Nov. 2004. Advisor: Ademola Amusa, Adekunle Ajasin University, Nigeria.

Tech Reports

Olalekan Ogunmolu, Xuejun Gu, Steve Jiang, Nicholas Gans. Nonlinear Systems Identification Using Deep Dynamic Neural Networks". *arxiv PrePrints, arxiv ID:1610.01439*, Oct 2016.

Olalekan Ogunmolu. Review of "Continuous Finite-Time Stabilization of Translational and Rotational Double Integrators". *arxiv PrePrints, arxiv ID: 1612.01607v2*, May 2015.

Invited Talks

UTSW, Dallas, TX — **A 3-DOF Neuro-Adaptive Patient Pose Correcting System For Frameless and Maskless Cancer Radiotherapy**, *Physics Research Seminar Series, Radiation Oncology Department, UT Southwestern Medical Center,* Dallas, TX, USA. March 2017.

IEEE Arlington, TX — **Towards automated accurate patient positioning in maskless cancer radiotherapy**. *IEEE Computational Intelligence Society,* UT Arlington, TX, USA. December 2015.

Poster Presentations

Texas Systems Day — **A 3-DOF Neuro-Adaptive Pose Correction System For Frameless and Maskless Cancer Radiotherapy**, *Texas Systems Day, Texas A & M University,* College Station, TX, USA. March 2017.

Mentoring

Undergraduate mentoring

Summer 2017 — Rachael Thompson. MIT Freshman (Starting in Fall 2017); Sleiman Safaoui. UTD Senior.

2016 - Now — Alex Tomkovich. Computer Engineering Junior.

Spring 2015 — Grant Carr. Computer Engineering Junior.

Masters Mentoring

2016 – 2017 — Adwait Kulkarn. Mechanical Engineering Masters student (Currently at Drov Technologies).

2015 — Ajith Venkateswaran. Computer Engineering Masters student (Currently at Samsung Research, America).

Languages

English Can read, write and speak fluently. *Lived in Nigeria, United Kingdom and United States.*

Yoruba Proficient *Native Nigerian Language. Spoken at home.*

Awards and honors

- President's **Teaching Excellence Award** for Teaching Assistants (UTD) Nom. Feb. 2017
- **Golden Key International Honour Society** Inducted Dec. 2016
- **IEEE RAS Travel Award** August 2016
- **Ericsson Graduate Fellowship** 2015 - 2016
- **Jonsson Scholarship** 2014 - 2015
- **Achievement Award, University of Florida** *(Declined)* Fall 2014
- **PTDF Overseas Scholarship Award** (∼1.7% acceptance) 2011
- **Federal Government (of Nigeria) Scholarship** (∼3.6% acceptance) 2002
- **Ondo State (Nigeria) Scholarship** (∼10% acceptance) 2004

Select services and leadership

Jan. 2017 **Reviewer**, ***IFAC***, International Federation of Automatic Control World Congress.

March. 2017 **Open Reviewer**, ***ICML***, OptNet: Differentiable Optimization as a Layer in Neural Networks.

Fall 2012 **Workshop participant**, *ILA Berlin Airshow*, Berlin, Germany.
Selected by Cassidian (an EADS company) for the *Aerospace Systems Engineering* workshop.

Summer 2012 **Workshop participant**, *Farnborough International Airshow*, NE Hampshire, England.
Selected by Airbus (an EADS company) among participants at the *UAV and Fighter Aircraft* workshop.

2016–present **Member**, *IEEE Boston*, Greater Boston, USA.

2015 – 2016 **Science instructor**, *IEEE Dallas Shoulder of Giants Workshops*, Dallas, TX.
Participant at IEEE Dallas Young Professionals community outreaches in promoting STEM education and awareness in the Dallas/Fort-Worth Metroplex.

Summer 2015 **Summer Science Program**, *University of Texas at Dallas*, Richardson, TX.
Trained high-school kids in basic robots control and programming with the Berkeley Snap! kit and arduino.

Computing

Programming C++, Python, Lua, MATLAB, LabVIEW.

Frameworks Point Cloud Library, OpenCV, Torch7, Eigen, Docker, Google Cloud Compute, AWS S3, AWS EC2, PyTorch, OpenAI Gym, MuJoCo, Numpy, SciPy, Scikit-Learn, C++11/14 standards.

OS Ubuntu, Debian, Windows.

OSRF ROS hydro, indigo, jade, kinetic. Xacro, URDFs, PR2 packages, gazebo, urdfdom-py, ros-control, message filters, eigen, tf, tf2, hector-quadrotor, kdl, slam-gmapping, rviz, rqt, amcl, orocos, controller-manager, geometry-msgs, sensor-msgs, nav stack.

Web HTML, Markdown, socket.io, node.js, and express.js.

Select OpenSource Projects

Savgol C++ Implementation of Savitzky-Golay Differentiation Coefficients and Filters. (Available at https://github.com/lakehanne/savitzky-golay)

GPS Catkinized version of Levine et. al's guided policy search algorithm in ROS Indigo (Available at https://github.com/lakehanne/gps). Dockerized version available at gps-docker.

Keyence Minimal source code for retrieving profile map from the keyence LJV-7000 series line scanners. (Available at https://github.com/lakehanne/keyence)

RBN Recurrent Batch Normalization of Neural Networks in Torch7. (Available at https://github.com/element-research/rnn)

DICE Sørensen-Dice coefficients in Torch7. (Available at https://github.com/lakehanne/nn).

FARNNs Training of multilayer networks, simple recurrent neural networks, long short-term memory cells (with peep-hole connections), fast LSTMS, and recurrent batch normalized FastLSTMs to model the relationship between Borel measurable sets. (Available at https://github.com/lakehanne/FARNN)