Olalekan Ogunmolu

Robotics | Control Systems | AI

Rerum Cognoscere Causas: To know the causes of things.

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omitted intentionally
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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.

Publications

Peer-Reviewed

Olalekan Ogunmolu, Adwait Kulkarn, Yonas Tadesse, Xuejun Gu, Steve Jiang, and Nick Gans. Soft-NeuroAdapt: A 3-DOF Neuro-Adaptive Pose Correction System For Frameless and Maskless Cancer Radiotherapy. *IEEE/RSJ International Conference on Intelligent Robots and Systems* (*IROS*), 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, Nicholas Gans, Tyler Summers. Robust Zero-Sum Deep Reinforcement Learning.

Tyler Summers, **Olalekan Ogunmolu**, Nicholas Gans. Robust Guided Policy Search for Deep Reinforcement Learning". *IROS 2017 Abstract Only Track*, Vancouver, BC, September 2017.

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.

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.

Invited Talks

Presentations

EFSC'17, Vancouver Soft Robotic Modules as Position Correcting Mechanisms in Cancer RT.
3rd Entrepreneurship Forum & Start-up Competition, EFSC'17, Vancouver, BC, Canada. September 2017.

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

IROS '17 **Robustness Margins and Robust Guided Policy Search for Deep Reinforcement Learning**, *International Conference on Intelligent Robots and Systems* Vancouver, BC, Canada. September 2017.

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.

Awards and honors

- Finalist at the 3rd Entrepreneurship Forum and Startup Competition — August 2017
  Sponsored by IEEE Robotics and Automation Society, KUKA AG, and Univ. Hamburg
- **NSF Doctoral Consortium Travel Award** (IROS 2017) — August 2017
- **Mary and Richard Templeton Graduate Fellowship** (UTD) — August 2017
- **ROSCon Scholarship** (Open Software for Robotics Foundation) — July 2017
- President's **Teaching Excellence Award** for Teaching Assistants (UTD) — Nom. Feb. 2017
- **Golden Key International Honour Society** — Inducted Dec. 2016
- **IEEE RAS/ISAM Travel Award** (to CASE 2016) — 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

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, MN).

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.*

Select services and leadership

June 17-Now **Member, IEEE Robotics and Automation Society**, [Member ID: 92127153].

June 2017 **Invited Contributor**, *IEEE/RSJ IROS Conference Abstract Only Track*, Vancouver, BC.

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.

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.

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.

Computing

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

Libraries 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, and kinetic distros. Xacro, urdfs, pr2 robot packages, gazebo, urdfdom-py, ros-control, message filters, eigen, tf, tf2, hector-quadrotor, kdl, slam-gmapping, rviz, rqt, amcl, orocos, controller-manager, geometry-msgs, rosaria, ros-arnl, sensor-msgs, nav stack. Familiar with staubli TX-90 and ur10 robot packages.

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)