

# Titus Lungu

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Los Angeles, California

U.S. Citizen

## Education

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### **Master of Science, Machine Learning and Artificial Intelligence, June 2017**

University of California, Los Angeles

Los Angeles, California

Henry Samueli School of Engineering and Applied Science

### **Artificial Intelligence Nanodegree, September 2017**

Udacity

### **Deep Learning Foundations Nanodegree, May 2017**

Udacity

### **Bachelor of Science, Mechanical Engineering, May 2016**

GPA: 3.90

Cleveland State University

Cleveland, Ohio

Washkewicz College of Engineering, Mandel Honors College

*Summa c. Laude, Tau Beta Pi Engineering Honors Society, IEEE Robotics and Automation Society, American Society of Mechanical Engineers, Cleveland Engineering Society, Engineering Co-op Program, President's List, Dean's List*

## Skills

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### *Computer*

C++; C#; HTML5; CSS; Python; MATLAB; Java; Git; Arduino; MS Visual Studio; Linux OS; ROS; SolidWorks; SolidWorks Simulation; Autodesk Inventor; Salome; Slicer; SAP; SmarTeam; MathCAD; Adobe Reader; MS Word, PowerPoint, Excel, Outlook

### *Manufacturing*

Subtractive: horizontal lathe, vertical mill, CNC machine coding; Additive: 3D printing

### *Languages*

English, Romanian, French

## Research Experience

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### **Robotics Control**, University of California, Los Angeles - Dr. Song-Chun Zhu

9/2016 - Present

*Center for Vision, Cognition, Learning, and Autonomy*

- Learned how to use the Robot Operating System (ROS) and send commands to a Rethink Robotics Baxter robot wirelessly through the Linux terminal.
- Investigated methods for creating a smooth position and velocity controller for the seven degree-of-freedom robot arms.
- Tested force/torque sensors in robot wrists to ensure accurate recording could be done through the respective ROS Topics.

### **Machine Learning**, Cleveland State University - Dr. Eric Schearer

5/2015 - 7/2016

*Mechanics and Control of Living Systems Laboratory*

- Using machine learning to improve control and incorporate intuitive caregiver feedback in Functional Electrical Stimulation neuroprostheses for patients with tetraplegia, to allow them to regain functionality in their arms.
- Using Gaussian Process Regression (GPR) in MATLAB to learn inverse dynamics of a system and use this to control the system in a new way.
- Working with Dr. Antonie van den Bogert to modify Dynamic Arm Simulation software to incorporate GPR for learning inverse dynamics of the human arm.
- Designing and building a robot to be controlled with GPR and learn new motions based on tactile feedback. Working with Dr. Hanz Richter.
- Working with the Physical Therapy department at Cleveland State University to modify toy electric cars for children with disabilities, particularly down-syndrome.

### **Active Surveillance as a Service**, Cleveland State University

8/2015 - 5/2016

*Senior Design Capstone Project*

- Creating a prototype of a cloud-hosted software to stream live surveillance footage from security cameras throughout a city.
- Utilizing machine learning and computer vision techniques to detect pedestrians in-frame and track individuals throughout a video and across multiple cameras.
- Developing portable security modules for students to carry and signal the occurrence of a crime via a button press, which captures GPS location of the crime.
- Constructing appropriate database infrastructure, hosted on Microsoft's Azure cloud, to collect and organize all data from the system and stream it to a client side app.
- Developing a client side app to stream live camera footage and provide GPS tracking of criminal suspects for law enforcement use.

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**Robotic Simulation**, Case Western Reserve University - Dr. Roger Quinn

6/2015 - 8/2015

*Biologically Inspired Robotics Laboratory*

- Learning to use Gazebo Simulation software in Ubuntu and wrote a comprehensive set of operating instructions.
- Compiling detailed list of simulation tools to help make informed decisions on the best software for the lab.

**Biomechanics**, Cleveland State University - Dr. Jason Halloran

12/2014 - 5/2015

*Mechanics and Control of Living Systems Laboratory*

- Designing simulation-informed prosthetic sockets for lower limb amputees utilizing Python, Salome, and Slicer.
- Using growth segmentation methods in Slicer to analyze geometries from MRI images.
- Developing preliminary script for automated creation of socket geometries using iterative analysis.

## Industry Experience

**Swagelok**, Valve Services Group - *Design Engineer Intern*

Solon, Ohio

5/2014 - 8/2014

- Led design and process/efficiency improvement projects while understanding valve inner workings and other fluid products.
- Designing, analyzing, and testing new test fitting for valves for high pressure applications.
- Optimizing tool chain layout of a mill-turn CNC machine to save \$40,000 per year by increasing cycle efficiency.
- Rewriting over 130 CNC programs for new tool positions for mill-turn machine.
- Cataloging, drafting, and redesigning over 500 unique assembly tools and company policy for future tooling organization.
- Arranging team meetings, presenting projects, and updating company documentation which resulted in a positive and progressive impact on upper management.

**Parker Hannifin**, Hydraulic Valve - *Design Engineer Intern*

Elyria, Ohio

10/2013 - 12/2013

- Working with Engineering, R&D lab, and Quality while understanding full process to produce products.
- Various research projects such as finding a replacement material for old copper-lead gaskets and a finding possible vendors.
- Lab testing/inspection of valve materials.
- Drafting and preparing material corrosion reports for customers.
- Quality testing of spool dimensions for various valve sizes.
- Finding appropriate replacements for valves that are obsolete and indicating valve parts for discontinuation.

**Cristal**, Reliability Department - *Reliability Engineer Co-op*

Ashtabula, Ohio

5/2013 - 8/2013

- Cooperating with Rotating Equipment Engineer using software such as SAP to compile information for plant equipment.
- Reviewing pipe circuits for coherence and recommend new more efficient piping circuits for the plant's hazardous chemicals.
- Drafting isometric drawings of HCl piping in the plant.
- Preparing inspection report summaries for administration to review and present projects to upper management.
- Communicating with OEMs to acquire data sheets and performance curves on their products.
- Inspecting in field for tanks, spools, pipes, heat exchangers, and other instrumentation.

## Publications, Conferences, Presentations

- **Senior Design Capstone Project**: "Active Surveillance as a Service", Cleveland State University, May 2016
- **Honors Thesis**: "Using Tactile Feedback and Gaussian Process Regression in a Dynamic System to Learn New Motions", Cleveland State University, May 2016.
- **University Journal**: Lungu, Titus; Tachynskyy, Igor; and Tayyara, Omri. "Walking Simulator Mechanism." *The Downtown Review*. Vol. 2. Iss. 2 (2015). <<http://engagedscholarship.csuohio.edu/tdr/vol2/iss2/4/>>.
- **Conference Poster**: Lungu, Titus; Schearer, Eric M. "Learning Inverse Dynamics with Gaussian Process Regression." The 9<sup>th</sup> Annual Cleveland State Interdisciplinary Research Conference. Cleveland State University. Cleveland, Ohio. Nov. 2015.
- **High School Presentation**: Lungu, Titus. "Robots, Prosthetics, and Artificial Intelligence." High School Fall Visit Day. Cleveland State University. Cleveland, Ohio. Oct. 2015.
- **Research Poster**: Lungu, Titus; Schearer, Eric M. "Learning Inverse Dynamics with Gaussian Process Regression." Engineering Research Day. Cleveland State University. Cleveland, Ohio. Oct. 2015.

## Honors

- National Science Foundation Graduate Research Fellowship Program, 2016
  - Honorable Mention for excellent research proposal.
- 1<sup>st</sup> Place, Senior Design Capstone Project, Cleveland State University, 2016
  - Interdisciplinary team, placed first out of over 60 teams (\$1,000).
- Summa c. Laude, Cleveland State University, 2016
- Outstanding Mechanical Engineering Student Achievement Award, Cleveland State University, 2016
  - Highest GPA out of mechanical engineering class.

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- Undergraduate Research Grant, Cleveland State University, 2015
  - \$1,000 stipend for machine learning research proposal.
- President's Award for Excellence in Diversity, Cleveland State University, 2015
  - Received in collaboration with the engineering Dean's Diversity Council for taking inclusion and mentorship initiatives.
- Honors College Scholarship, Cleveland State University, 2012-2016
  - Full tuition, four year scholarship (\$40,000) based on strong academic record and personal statement.

## Leadership

**Jack, Joseph and Morton Mandel Honors College**, Cleveland State University

8/2012 - 5/2016

Honors Student

- Keynote speaker at the Honors College dedication ceremony, November 9, 2015.
- Member of the search committee for the dean of the Honors College at Cleveland State.
- Representative to the Board of Trustees on behalf of the Honors College at Cleveland State.
- Editor for *The Downtown Review*, a "double-blind" peer reviewed academic journal.

**Washkewicz College of Engineering**, Cleveland State University

1/2014 – 5/2016

Student Leader

- Student representative to the Inter-University Council meeting in Columbus, Ohio. Met with state senators and representatives to discuss funding, educational, and social issues affecting Ohio public universities.
- Working with Parker Hannifin executives and engineers to design a new company-sponsored laboratory in the engineering college.
- Working with the dean, architects, and professors on the Leadership Planning Team for the new engineering building.
- Attending *Ideas for Tomorrow* Speaker Series at The Cleveland Clinic, featuring Dr. Sebastian Thrun and Dr. David Agus.
- Attending Youth Forum on *The Power of Innovation* at the City Club of Cleveland.

**American Society of Mechanical Engineers**, Cleveland State University

1/2013 - 1/2015

President (2014), Treasurer (2013)

- Designing and constructing a hexapod robot for salting snowy walkways and spreading fertilizer on various terrains.
- Placing first in university's catapult competition for distance and target destruction.
- Assisting the Dean's office with plans for college renovations and office relocation.
- Repairing Plastic Injection Molding Machine in Cleveland State University's machine shop.
- Partnering with Piccadilly Group LLC., a new small business in Cleveland, and help market them as a fundraising event.

**Dean's Diversity Council**, Cleveland State University

11/2014 - 5/2015

Student Representative

- Received the President's Award for Excellence in Diversity 2014-2015.
- Created mentoring program to pair engineering students with industry engineers to provide tailored guidance and one-on-one support for students in everything from career building to time management and studying tips.
- Communicating student diversity issues and increasing awareness of council's actions and events throughout college.
- Ensuring the inclusion and participation of minorities through events, conferences, and competitions at Cleveland State University and elsewhere.

**Presidential Student Ambassador**, Cleveland State University

9/2013 - 12/2014

- Representative and volunteer at presidential events, Board of Trustees functions, awards ceremonies, and charitable events such as *Relay for Life*.
- Volunteering at and attending TEDx Cleveland State University 2014, *The Right to Dream*.

**Youth Group Committee**, Cleveland Romanian Baptist Church

4/2010 - 5/2014

Secretary

- Partaking in two humanitarian aid/mission trips to impoverished areas of the Romanian countryside.
- Communicate events, meeting times, and other proceedings to all members of youth group and church leadership.
- Helped organize local, national, and international activities and programs including holiday concerts, national conventions and youth camps across the US, and trips to Romania.