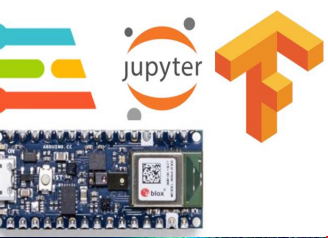
AI

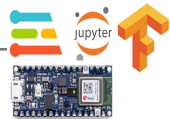
INTRODUCTION

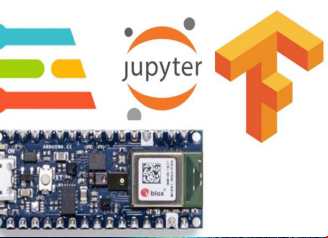
Dennis A. N. Gookyi



CONTENTS

- Course Organization and Syllabus





INSTRUCTOR

- Instructor
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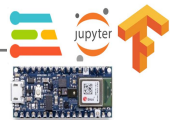
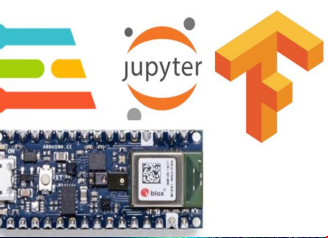
  - Email: dennisgookyi@gmail.com
  - Phone: 0203493435
  - Research Portals:
    - https://www.researchgate.net/profile/Dennis-Gookyi
    - https://sites.google.com/view/eisedlab





INSTRUCTOR

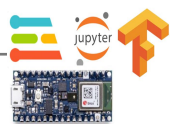
Instructor

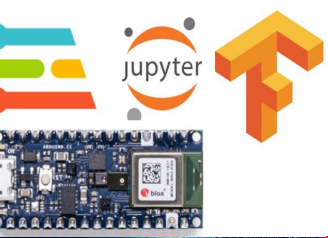
Education

- Ph.D. in Information and Communication Engineering, Hanbat National University, South Korea, 2021.
- M.Eng. in Information and Communication Engineering, Hanbat National University, South Korea, 2017.
- B.Sc. in Computer Engineering, Kwame Nkrumah University of Science and Technology, Ghana, 2009.

Employment

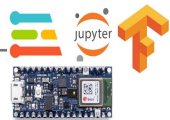
- Research Scientist, CSIR-INSTI, Ghana, 2022 – Present.
- Researcher, Korea Electronics Technology Institute (KETI), South Korea, 2021 – 2022.
- Research and Teaching Assistant, SoC Design Lab, Hanbat National University, South Korea, 2014 – 2021.
- RTL Design Engineer, Future Systems, South Korea, 2015 – 2016.
- Teaching Assistant, Computer Engineering Department, Kwame Nkrumah University of Science and Technology, Ghana, 2013 – 2014.

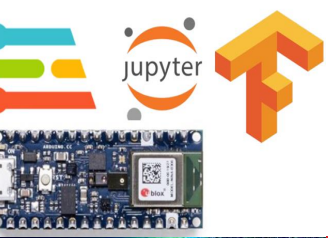




LEARNING OUTCOMES

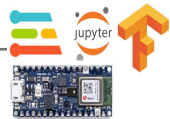
- Expected Learning Outcomes
  - Learn about a discipline that mixes AI with small devices, such as microcontrollers and sensors, whose main characteristics are ultra-low power consumption, 32-bit CPUs, and a few kilobytes of memory
  - Understand the use of AI software platforms including TensorFlow and Edge Impulse design and deploy models on edge devices

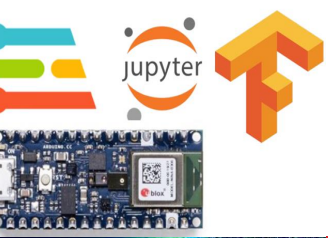




PREREQUISITES AND GRADING

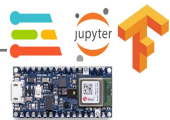
- Prerequisite
  - Inclination toward computer programming
  - Inclination towards Digital Systems Design
  - Engineering mindset
  - Inquisitive about the physical world
- Grading scheme: Homework (10%), Participation (5%), Project (15%), Exam (70%)
  - Homework: hybrid grading show your work in class
  - Participation: attendance, ask questions, answer questions, be active
  - Project: non-trivial implementation of something useful by applying knowledge including and beyond what's learned in class

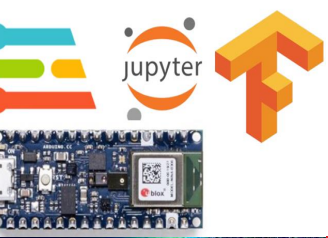




LEARNING APPROACH

- Learning approach:
  - Type up your own code, and make it work on your device
  - Learn from sample code, assimilate then modify, integrate, or extend
  - Be ready to show your work
  - Read manuals and product specification documents

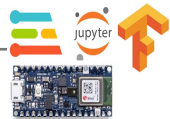




COURSE OUTLINE

- Schedule

Lecture	Topic	
01	Course Overview	Part 1 Fundamentals
02	Course Hardware and Software Toolchain Setup	
03	Introduction to TinyML	
04	The Machine Learning Paradigm	
05	The Building Blocks of Deep Learning	
06	Convolutional Neural Networks	
07	Introduction to Edge Impulse Studio	Part 2 Applications & Deploying
08	Gesture Classification	
09	Data Engineering	
10	Keyword Spotting	
11	Image Classification	
12	Responsible AI	



TEXTBOOKS AND LINKS

- Textbook and Links
  - https://www.tensorflow.org/lite
  - https://www.edgeimpulse.com/
  - https://micropython.org/
  - https://www.adafruit.com/
  - https://www.arduino.cc/
  - https://www.st.com/en/microcontrollers-microprocessors/stm32-32-bit-arm-cortex-mcus.html
  - https://www.espressif.com/en/products/socs/esp32