

# Mark Dyehouse

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## Education:

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### Northwestern University (Fall 2018-Present)

Master of Science in **Robotics**

Evanston, IL

### Carnegie Mellon University (Spring 2016)

Bachelor of Science in **Physics**, Minor in **Chinese Studies**

Pittsburgh, PA

Winner of **Pickering Scholarship** for study abroad in Shanghai

Received **Pennsylvania Space Grant**: research at CMU Physics department summer 2014

Spring 2016 MCS **Dean's List with High Honors**

### Shanghai International Studies University (Summer 2013)

Shanghai, China

## Skills:

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- Programming Languages: Scala, Python, ML, C, some C++, Mathematica
  - Frameworks, Platforms, and Libraries: NumPy, OpenCV, ROS, Apache Kafka and Spark (Core, ML, GraphX, and Streaming), Cucumber for automated tests, Sci-kit library, Databricks, cv2
  - Software: Git, SBT, Atlassian (Bitbucket, Jira, Bamboo, Confluence), IntelliJ, gdb, VirtualBox, Maple, Solidworks
  - Other skills: Agile (Scrum), Test-Driven Dev, 3D printing, laser cutting, some Arduino, federal gov. proposals
  - Language: Mandarin Chinese (written and conversant)

## Research & Work:

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- **Graduate Student** (NU MSR 2018-Present): Won team competition in embedded systems in robotics with ROS class with "Drawing with Sawyer" project.
  - **Software Engineer** (Omnicell Feb-Sep 2018): Telemetry data streaming, processing, and analytics pipeline using Scala, Spark, and Kafka with AWS, Databricks; **Won hackathon's "Most Cross-Functional" Award**, fuzzy text matching system for comparing customer and manufacturer descriptions of medical items using a customized variant of Levenshtein distance allowing for abbreviations
  - **Software Developer** (Management Science Associates, Jan 2017-Jan 2018): Backend software development for data ingestion (ETL) pipeline using Spark (on YARN and standalone), Kafka, Scala, HBase, Cucumber, Elasticsearch; Hadoop environment, MapR
  - **Research Assistant** (2016): Designing skin system for closed-loop inflatable aeroponic plant habitat on Mars (small team), responsible for plant support design and resource/power distribution map and organism selection:
    - **Poster at American Society of Gravitational and Space Research 2016 Conference**
  - **Research Assistant** (Summer 2016): Working with Nao robots for perception of objects involved in playing soccer using sci-kit image, cv2; region of interest specifier for classifier; gui for data labeling (PyQt)
  - **Lockheed Martin** (Summer 2015): College student technical specialist; Dev-ops and Network engineering
  - **Research Internship** (Summer 2014): Characterized liquid-liquid interfacial isotherm, analyzed microscope image data (excel, matlab)

## Projects and Activities:

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- **Drawing with Sawyer**: My tasks: path-planning and information extraction, image processing for transformation from image space to the task space. **First place** in team competition. Video: <https://youtu.be/AccB97IPMUE>
  - **Sorting of Kilobot Robots by Size using Brazil Nut Effect**
  - **Local Coordinate System Creation (and using it to achieve a non-trivial shape) in Swarm of Kilobot Robots**
  - Built from scratch: optimized Binary Decision Trees & Multinomial Logistic Regression: speech predictions; neural net with customizable hidden layers and units: optical character recognition (2018)
  - Language classification (multiple languages) and transcription (English) using only visual data (2016)
  - Mars plant habitat light system design, constraints for protection from risks on Martian surface
    - Build18 Competition: (Fall, Spring 2013-14): piezo element, oscilloscope: knock triangulation
  - Pololu 3pi robot programming for line following with onboard sensors, use servo motors to draw lines with a pen
  - MHacks V project: Memory Museum using Unreal game engine for Oculus Rift
  - 3D-Printed Microscope iPhone case (Fall 2014): glass bead lenses, designed in Solidworks
  - Built Scala Trie for Spark GraphX, Spark ML; Chess with 3-D graphics using Python and VPython
  - Palantir Puzzle Hunt at CMU (2013-15); Extra for Netflix show: Mindhunter, CMU Ski Team 2014-16
  - International Justice Mission Co-President CMU chapter; Dossier Art Magazine Editor; CMU Ski Team