

# HANS KUMAR

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## EXPERIENCE

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### HEBI ROBOTICS | PITTSBURGH, PA

#### Mechanical/Controls Intern, Summer 2017

- Designed and optimized a high-speed, compliant delta parallel robot using industrial series elastic actuators
- Demonstrated modularity of the parallel system by adding a camera, gripper, and moving base plate in a pick-and-place demo
- Assembled and documented HEBI actuators for consumer use

### CARNEGIE MELLON CERLAB | PITTSBURGH, PA

#### Undergraduate Research Fellow, Summer 2016

##### Medical Phantom Group:

- Developed realistic models of the hand and dura to train surgical residents and test medical devices
- Validated different aspects of the models with professionals at the Allegheny General Hospital

##### UAV Group:

- Researched and implemented different image segmentation techniques to help a drone accurately detect areas of road and grass

### TEAM CHILDREN | COLLEGEVILLE, PA

#### Volunteer Tech, Summer 2014

- Refurbished old computers by updating software and hardware
- Identified underprivileged schools in need of renewed technology

## PROJECTS

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### SEARCH AND RESCUE ROBOT

#### 16-311 Introduction to Robotics, Spring 2017

- Exercised principles of mechanical design to build a teleoperated robot capable of navigating rough terrain, ramps, and stairs
- Tested the robot against other robots in varied obstacle courses

### MECHANICAL CRANE PROJECT

#### 24-262 Stress Analysis, Spring 2017

- Designed an aluminum crane using a truss structure to lift an object as high as possible and minimize overall crane weight

### C0 VIRTUAL MACHINE

#### 15-122 Principles of Imperative Computing, Fall 2017

- Implemented a virtual machine for an introductory version of C
- Ensured safety of arbitrary c0 code by taking care of low-level memory and data manipulations during execution

### PERCUSSION TUTOR

#### 15-112 Fundamentals of Programming, Spring 2016

- Developed an interactive Python drum tutor and audio visualizer using various audio processing modules
- Presented project to peers as one of the top fifteen term projects

## EDUCATION

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### CARNEGIE MELLON UNIVERSITY

#### PITTSBURGH, PA

B.S. in Mechanical Engineering, May 2019

Additional Major in Robotics

GPA: 3.63/4.0

### SPRING-FORD HIGH SCHOOL

#### ROYERSFORD, PA

High School Diploma, June 2015

## SKILLS

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**Programming:** Python, C, Matlab, HTML/CSS

**CAD:** Solidworks, Creo Pro/E, Blender

**Machines:** CNC Router, Mill, Drill Press, Band Saw, 3D Printer, Laser Cutter

**Languages:** Hindi (Native), Spanish (Basic)

## COURSEWORK

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### Current Courses:

- Artificial Intelligence and Problem Solving
- Robot Kinematics and Dynamics
- Dynamics
- Heat Transfer
- Design I

### Completed Courses:

- Intro to Robotics
- Fluid Mechanics
- Stress Analysis
- Thermodynamics
- Statics
- Principles of Imperative Computing
- Biomedical Engineering Lab
- Statistics and Quality Control
- Numerical Methods
- Differential Equations

## ACTIVITIES

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- Vice President of CMU OM
- Phi Delta Theta Fraternity
- Drummer for CMU Bhangra Team