

# DUO ZHANG

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## EDUCATION

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### Shandong University

B.E. in Computer Science Department

2018/06 - 2020/06

Undergraduate in Energy and Power Engineering Department

2016/09 - 2018/06

## RESEARCH EXPERIENCES

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**Changhe Tu's lab, Interdisciplinary Research Center, Shandong University** 2020/01 - Present  
*Research Assistant* Qingdao, Shandong, China

- **Tunneling-free, Second-order Convergent, Model-based Grasp Policy Search**

I am developing a tunneling-free, second-order convergent, model-based grasp policy searching method. This model can generate a pose for the Barrett Hand with high grasp quality in real time and be guaranteed strictly tunneling-free between robot hand and the target.

- **Human-like Trajectories Generation for Robot Arms Given Certain Properties**

I designed a model using VAE + LSGAN which can generate human-like trajectories for some scenarios involving human robot interactions with certain given properties like smoothness and length etc. The main purpose of this project is to make the robot behavior more understandable and legible for human partners.

**Sriram Sankararaman's lab, Computer Science Department, UCLA** 2019/07 - 2019/09  
*Research Assistant, Cross-disciplinary Scholars in Science and Technology Program* LA, CA, USA

- **Identification of Cell-type-specific Genetic Regulation of Gene Expression for Transcriptome-wide Association Studies**

We developed a new approach leveraging Tensor Component Analysis (TCA) to estimate cell-specific expression levels from bulk tissue measurements using single nucleotide polymorphisms (SNPs) as predictors. We show that this model performs well in simulations and applied it to a cohort of around 1,500 individuals with expression measured in blood, identifying SNPs that predict a significant proportion of variation in expression levels in four major white blood cells. These SNPs and their estimated effects can be used for cell-specific TWAS in large cohorts with genetic data such as the UK Biobank, which includes over 500,000 samples. I also built and published a R package named TWAS for our project. Here is our project's Poster. ([Our Poster Link](#))

**Youjun Lu's lab, National Astronomical Observatories, CAS** 2018/04 - 2018-05  
*Undergraduate Researcher* Beijing, China

- **Determination of Physical Parameters of Binary Black Holes and the Origin of Binary Black Holes with Gravitational Wave Data**

I simulated various gravitational wave signals with different parameters in a wide range and set them as templates. Given the templates I trained a Bayesian Classifier determine the likelihood for a signal to be a gravitational wave and matching the parameters with the templates.

**Guochao Gu's Lab, Material Science Department, Shandong University** 2017/07 - 2018/07  
*Undergraduate Researcher* Jinan, Shandong, China

- **Solid-Liquid Coordinated Deformation Mechanism and Defect Control in the Process of Deformation Forging of Deformed Aluminum Alloy**

I was taking charge of metal grain modeling and grain edge recognition. The grain modeling part was intended to build the 3D grain voronoi cells to simulate the shape of grain cells when the cells are

worn and the gap between cells are filled with liquid. Then the simulated grain cells are exported to ABAQUS for analyzing the mechanic performance.

## PRESENTATION

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Identification of cell-type-specific genetic regulation of gene expression for transcriptome-wide association studies

*Poster presentation at UCLA CSST program*

## HONORS AND REWARDS

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### **National Scholarship**

Sponsored by Ministry of Education of the People's Republic of China

### **Excellent Cadre Scholarship**

Sponsored by Shandong University

### **Excellent Student Scholarship**

Sponsored by Shandong University

### **Provincial Third Prize of China Undergraduate Mathematical Contest in Modeling**

Sponsored by China Society for Industrial and Applied Mathematics

### **Provincial Third Prize of The Chinese Mathematics Competitions**

Sponsored by China Mathematics Society

### **Honorable Mention of Mathematical Contest in Modelling (MCM)**

Sponsored by Mathematical Association of America

### **Province Third Prize of Internet+ Innovation and Entrepreneurship Competition**

Sponsored by Ministry of Education of the People's Republic of China

### **Shandong University Basketball Game Advanced Individual**

Sponsored by ANTA sports

## SKILLS

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### **Programming Languages**

C++, Python, JavaScript, Java, Matlab, R

### **Other Skills**

Metal Material Processing (including turning, milling, planing, forging, casting, molding, 3D printing and some CNC technologies)

## GRADES

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### **English Test**

- **TOEFL**

Reading: 28   Listening: 28   Speaking: 23   Writing: 28   Total: 107

### **Robotics Involved Tests**

- **Application in Robotics:**

*Grade: 98, Level: First Class*

I trained a simple Convolutional Neural Network to classify different types of trash (Cubes with different colors) and employed the network to a simple DOBOT Robot Arm with a sucker and a camera on it. Then the Dobot robot arm can correctly accomplish the trash classification and pick up the trash and drop it to the right trash bin.

- **Basics of Robotics:**

*Grade: 95, Level: First Class*

- **Machine Learning**

*Grade: 89, Level: First Class*

- **Theoretical Mechanics**

*Grade: 85, Level: First Class*

- **Circuits and Electrical Technology**

*Grade: 95, Level: First Class*

• Advanced Mathematics	<i>Grade: 95, Level: First Class</i>
• Complex Functions and Laplace Transformation	<i>Grade: 94, Level: First Class</i>
• Probability Theory and Mathematical Statistics	<i>Grade: 95, Level: First Class</i>
• Numerical Analysis	<i>Grade: 91, Level: First Class</i>
• Computer Vision	<i>Grade: 92, Level: First Class</i>
• Human Computer Interaction	<i>Grade: 90, Level: First Class</i>
• Cognitive Science and Brain-like Calculation	<i>Grade: 90, Level: First Class</i>
• Basic Physics	<i>Grade: 90, Level: First Class</i>

## GPA

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- Freshman  
*3.97/4.00*
- Sophomore  
*3.92/4.00*
- Junior  
*3.66/4.00*
- Senior  
*3.64/4.00*

**TOTAL: 3.77**

## PERSONAL TRAITS

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Highly motivated and eager to learn new things  
 Strong leadership and cooperation skills  
 Ability to work as an individual as well as in group  
 Enthusiast for basketball and power lifting (newbie in power lifting)  
 Skilled calligrapher in Chinese