

# Rao FU | Ph.D. Student

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## Education

**Brown University | Dept. Computer Sciences**

*Computer Science Ph.D. Student*

Concentration: Vision, Graphics and Robotics

**Providence, RI, USA**

*Sept. 2021 – Present.*

**University of Chinese Academy of Sciences | Dept. Computer Sciences**

*Bachelor of Computer Science*

Overall GPA: **3.72/4.00**. Core GPA: **3.82/4.00**.

*Outstanding Thesis Awards.*

**Beijing, China**

*Sept. 2017 – Jun. 2021*

**University of Southern California | Viterbi School of Engineering**

*Visiting Student*

GPA: **4.00** / 4.00

**Los Angeles, CA, USA**

*Jan. 2020 – May. 2020*

**Beijing National Day School**

*Student*

**Beijing, China**

*Sept.. 2011 – Jul.. 2017*

## INTERNSHIP

**Microsoft Research, Asia | Speech Group, Visual Computing Group**

*Award of Excellence at Star of Tomorrow Internship*

**Beijing, China**

*Mar. 2021 – July. 2021*

**University of California, San Diego | SU Lab**

*Visiting Scholar*

**San Diego, CA, USA**

*May. 2020 – Nov. 2020*

## Publication and Submission

[1]: Yuhui Yuan, **Rao Fu**, Lang Huang, Weihong Lin, Xilin Chen, Jingdong Wang. *HRT: High-Resolution Vision Transformer for Dense Prediction.*

*Conference on Neural Information Processing Systems.(NIPS2021)*

[2]: **Rao Fu**, Jie Yang, Jiawei Sun, Fanglue Zhang, Yu-Kun Lai, Lin Gao. *RISA-Net: Rotation-Invariant Structure-Aware Network for Fine-Grained 3D Shape Retrieval.*

*Submit to IEEE Transactions on Pattern Analysis and Machine Intelligences.(TPAMI)*

## Professional Service

**Conference Reviewer:** Computational Visual Media Conference 2021 (CVM2021)

## Research Experience

Computer Vision.....

**Research on High-Resolution Transformer.**

*Research Group: Visual Computing*

**Microsoft Research, Asia**

*March. 2021 – July. 2021*

- Proposed a transformer-based neural network for dense prediction tasks.
- Achieved state-of-the-art performance on COCO human pose estimation benchmark.

Learning Based Robotics.....

**Research on Humanoid Gripper Grasping.**

*Guide: Prof. Hao Su*

**University of California, San Diego**

*Aug. 2020 – Nov. 2020*

- Proposed a network mapping object action space to robot configuration space, facilitating robot grasping.
- Proposed a motion planning algorithm that effectively boost the efficiency of grasp execution.
- Finished a paper as a co-author and the paper was submitted to NIPS2021.

**Research on Articulation Grasping for Fast Exploration.**

*Guide: Prof. Hao Su*

**University of California, San Diego**

*May. 2020 – Nov. 2020*

- Studied the problem of geometric based manipulation for efficient exploration.
- Proposed a novel neural network architecture that predicts grasp proposals efficiently and effectively.

- Finished a technical paper as a co-author and the paper was submitted to CVPR2021.

## Learning Based Graphics, Vision and Geometry Processing.....

### **Research on Emotional Talking Head Generation.** TAL Education; Institute of Computing Technology, CAS

Guide: Prof. Dinesh Manocha; Prof. Yu-Kun Lai; Prof. Lin Gao Sept. 2020 – Nov. 2020

- Designed a pipeline that generates high-quality speech-driven talking head video with expressive emotion.
- Contributed to *TAL Education Group* Online School project.
- Finished a technical paper as first author and the manuscript was submitted to CVPR2021.

### **Research on Fine-grained 3D Shape Retrieval.** Alibaba; Institute of Computing Technology, CAS

Guide: Prof. Fanglue Zhang; Prof. Yu-Kun Lai; Prof. Lin Gao Sept. 2019 – May. 2020

- Proposed a deep architecture for rotation-invariant fine-grained 3D shape retrieval.
- Constructed and released a fine-grained 3D shape retrieval [dataset](#).
- Contributed to *Alibaba* 3D Online Shopping system.
- Completed an academic paper as first author and the manuscript was submitted to IEEE TPAMI.

### **Research on Single Image Reconstruction.** Institute of Computing Technology, CAS

Guide: Prof. Lin Gao. Jul. 2019 – Sept. 2020

- Combined parameterized modelling methods in traditional graphics algorithms with neural networks to reconstruct outdoor scene from a single image.

## Mathematics.....

### **A Geometric Solution to Multi-person Meeting Problem.** Beijing National Day School

Guide: Tiehan Li Jan. 2017 – Feb. 2017

- Solved the multi-person meeting problem by formulating a dynamic programming problem into a high-dimensional geometric problem.
- Finished a math thesis.

### **A Concise Discriminant of Cubic Real Coefficient Equations.** Beijing National Day School

Guide: Tiehan Li Sept. 2016 – Dec. 2016

- Proposed a concise discriminant of cubic real coefficient equations. The method is applicable when the equation has one real root and two imaginary roots, more applicable than Cardano formula.
- Finished a math thesis.

## Volunteer Experience

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### **Starry Sky Program 2019.**

- Organizer of popularizing STEM knowledge to left-behind female students in Mianyang, Sichuan Province.

### **Starry Sky Program 2018.**

- Organizer and teacher of popularizing STEM knowledge to left-behind female students in Huaihua, Hunan Province.

## Awards and Honors

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**07.2021:** Award of Excellence at Star of Tomorrow Internship.

**07.2021:** Outstanding Thesis Awards at UCAS.

**09.2020:** Excellent Comprehensive Performance Scholarship(top **15%** in the Dept. of CS).

**12.2019:** First Prize in CCF Big Data & Computing Intelligence Contest. Ranking:**1%**

**09.2019:** National Inspirational Scholarship(top **5%** among all competitors at UCAS).

**09.2019:** Excellent Comprehensive Performance Scholarship(top **15%** in the Dept. of CS).

## Skills

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**Standard Tests:** TOFEL 108, GRE 330

**Programming:** C/C++, Python, Matlab, Latex, HTML, CSS, VHDL

**Tools:** PyTorch, TensorFlow, OpenGL, Sapien, Vim, Git, Docker, Kubernetes

**Software:** Autodesk Maya, Adobe Illustrator, Adobe Photoshop, Bugzilla, Vivado

## Extracurricular Activities

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**03.2019:** The 93rd place in the 38th Beijing Open Half Marathon Park Run.

**01.2019-05.2019:** Writer, actor and vice president of UCAS *Dreamer* drama club.

**09.2018-07.2019:** President of UCAS Swimming Club (*Excellent Student's Club of UCAS*).