Yushu An

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Education

Exchange Student *Oct 2022 – Dec 2022*

Department of Technology and Innovation, **University of Southern Denmark**, Sonderborg

MSc in Mechatronics Engineering *Sep 2020 – Apr 2023*

GPA: 3.72/4; School of Mechanical Engineering, **Northwestern Polytechnical University**, Xi'an

Rank first in the major considering comprehensive assessment results

BSc in Mechatronics Engineering *Sep 2016 – Jul 2020*

GPA: 3.63/4; Honors College, **Northwestern Polytechnical University**, Xi'an

Studied in an advanced class and obtained the postgraduate recommendation

Research Experience

Project of working station training in VR *Oct 2022 –*

with a MSc. IB student who is opening his own start-up company within trainings in virtual reality, developed a working/sorting station training application for new employees.

- Constructed a VR scene of the working station by using Unity3D
- Taught employees to do the job like putting packages in specific box in the VR scene

Project of Unmanned laboratory *Apr 2021 –*

with Institute of Biological Evidence in Xi'an Jiaotong University, constructed a mobile manipulator and digital twin system for it to solve the problems of tedious experimental steps and long waiting time

- Integrated a mobile manipulator with functions of map establishment, navigation and end-effector alignment
- Created a virtual model for the digital twin of the mobile manipulator in Unity3D
- Realized the two-way connections of data that ties the virtual and real products together through ROS (Robot Operating System) and Modbus communication protocol
- Wrote scripts in Unity3D and realized simulation of collaborative manipulator before operation

Evaluation model for production and test process of aerospace liquid propulsion products *Jun 2021 – Sep 2022*

with China Academy of Aerospace Liquid Propulsion Technology, built evaluation model for its production and test process of aerospace liquid propulsion products to guide the construction of its manufacturing cells

- Put forward partial evaluation elements and sub elements according to the theory of 5M1E
- Investigated a number of cells in China Academy of Aerospace Liquid Propulsion Technology, such as engine assembly, casting, electroplating, etc., to iterate and optimize evaluation elements and criteria
- Participated in writing "The technical scheme of the aerospace liquid propulsion process evaluation model" and "The work guide for construction of advanced manufacturing cells of aerospace liquid propulsion products"

Vision system of hull's sub-assembly welding robot *Sep 2020 – Oct 2021*

with Shenzhen Youlian Shipyard, designed a vision system for its hull's sub-assembly welding robot equipment and experimented on it, so as to achieve high efficiency, high quality and high Automated welding process

- Installed laser transmitters and cameras on the gantry, which are used to scan the workpiece before welding
- Analyzed images and designed an image recognition algorithm to recognize welding seams in images
- Made the information file of welding seams and connected it with the offline programming system

Publications

Papers

1. Zheng, C., **An, Y.**, Wang, Z., Wu, H., Qin, X., Eynard, B. and Zhang, Y. Hybrid offline programming method for robotic welding systems. Robotics and Computer-Integrated Manufacturing, 2022, 73, 102238. (SCI, IF = 5.666)
2. Zheng, C., **An, Y.**, Wang, Z., Qin, X., Eynard, B., Bricogne, M., Le Duigou, J. and Zhang, Y. Knowledge-based engineering approach for defining robotic manufacturing system architectures. International Journal of Production Research, 2022, 1-19. (SCI, IF = 8.568)
3. Zheng, C., **An, Y.**, Wang, Z., Qin, X., Yu, F., and Zhang, Y. Heterogeneous requirement gathering for generative design of robotic manufacturing systems. Procedia CIRP, 2021, 104, 1861-1866. (EI)
4. Zheng, C., **An, Y.**, Wang, Z., Qin, X. and Yu, F. Application of configuration principle on knowledge-based engineering for manufacturing system design. Procedia CIRP, 2021, 104, pp.1378-1383. (EI)

Patent

A method of task allocation and path planning for robot welding system installed on mobile platform. In review: CN113118675A

Honors

National scholarship (*top 1%, twice*)	Northwestern Polytechnical University	*2021 – 22*
The First Prize scholarship (*three times*)	School of mechanical engineering	*2020 – 22*
University - level Outstanding Postgraduate	Northwestern Polytechnical University	*2021*
College - level Outstanding Student	Honors College	*2018*

Professional Skills

- Familiar with C#, Python and PLC ladder logic programming language
- Ability to use Unity3D to develop scripts for robot kinetic simulation, VR scene and digital twin system
- Ability to use ROS under Linux to complete visual mapping and navigation of mobile robots
- Proficiency with some tools including Solidworks, AutoCAD, Delmia, Matlab and other software for modeling and simulation
- Familiar with stereo camera and other visual equipment, and able to use OpenCV and image recognition algorithms like Mask R-CNN

Work Experience

Course assistant — School of mechanical engineering — *2020 – 22*

Assistant of online summer international course "Smart Product Development" taught by Prof. Fei Yu and Prof. Elias Ribeiro Da Silva in University of Southern Denmark

- Assisted to keep students' class in order
- Made statistics on students' information and scores
- Did other works like giving out the course completion certificate, writing summary report of the course, etc.

Intern — Beijing Jingdiao Co., Ltd — *Jul 2020 – Aug 2020*

Experienced full production process of 3D modeling, programming, processing and assembly

- Learned how to build 3D model and generate machining program in a CAM software named SurfMill
- Used the SurfMill software and NC Machine Tool to complete the design and machining of a fingertip top toy

Hobbies

Badminton, reading, listening to music