

## Personal information

Name: Wang Shuai / Jack

Age: 42

Education: Ph.D. (Institute of Physics, Chinese Academy of Sciences / Post-Doctor Zhejiang University)

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## Work and study experience

Yi Sheng 2021.05 - present

### Technical Art

Study 3D modeling workflow and Unity shader, DCC art tools and game engines. Develop VR application based on UE4. Mastered tools: 3D Max, Maya, PS, Substance Painter, Substance Designer, Zbrush, VRED, C4D, Unity3D and UE4 etc.

United Imaging Healthcare Technology Co., Ltd 2011.11 - 2021.05

**I successively served as 3D algorithm engineer, R&D Manager, Senior manager, R&D Director, Product Director and CEO of software business department.**

**3D algorithm engineer:** responsible for colon segmentation algorithm, colon centerline extraction, colon polyp CAD diagnosis, lung segmentation, lung nodule CAD diagnosis, nerve fiber and brain fusion visualization.

**R&D manager/Senior manager/Director:** lead the application and algorithm R&D team to develop 1<sup>st</sup> generation medical image 3D visualization engine, and develop advanced medical post-processing application algorithms including: registration, segmentation, functional parameter calculation, CAD diagnosis and other algorithms. Responsible for Review and Filming application development. Lead the R&D team to develop 3D visualization algorithms for medical images, 40 advanced post-processing applications, and medical VR applications.

**Product Director:** lead the team and product definition, competitive product analysis, customer feedback collection, product optimization and new product research on imaging equipment and post-processing workstations.

**CEO of Healthcare Software Business Department:** Lead the software R & D team (Shanghai, Wuhan, Shenzhen) to provide unified software platform, R&D equipment control software and more than 40 advanced applications of MR \ CT \ MI post-processing for medical imaging devices. NMPA, CE and FDA certification of products; participate in product definition; technical roadmap decision; optimize project management process; build staff training system.

Zhejiang University	2010.09 - 2011.10	<b>Postdoctoral Fellow in Graphics (State Key Laboratory of CAD&amp;CG)</b> A deformable surface model is proposed to simulate the flow behavior of water droplets on different solid surfaces, so as to achieve real-time rendering. Article published in IEEE.
Chinese Academy of Sciences Institute of Physics	2005.09 - 2010.07	<b>Student, Ph. D. in Condensed Matter Physics (Master and Doctor)</b> Based on the first-principle electronic structure spin torque simulation calculation software package, relevant achievements have been published in more than 10 international physical journals such as PRL and PRB.
Shenyang University of Technology	2003.07 - 2005.09	<b>University Teacher</b> He teaches physics experiments, computer fundamentals, and edits college physics textbooks.
Shenyang University of Technology	1999.09 - 2003.07	<b>Student, Bachelor of Applied Physics</b> Molecular dynamics simulation of hydrogen molecules adsorbed on carbon nanotubes (C + +), published in SCI journals in China.

### Honors and Awards

- In 2020, Shanghai Young Entrepreneurs Association as a representative of United-imaging
- High-level innovation and entrepreneurship talent in Jiading District in 2016
- Scholarship of Institute of Physics, Chinese Academy of Sciences, 2009
- Three good students of Chinese Academy of Sciences in 2009
- Three good students of Chinese Academy of Sciences in 2008

### Work Related Representative Outcomes

- Papers: More than 10 papers published in PRB, PRL, IEEE and other international journals
- Patents: 17 domestic and international patents related to medical image processing algorithms. (13 authorized/registered and 4 applied)
- National Projects: Participated in 3 medical imaging projects of the Ministry of Science and Technology and Shanghai Science and Technology Commission
- Lose weight: To satisfy the need of work, I lose weight of 40kg by running and maintained so far
- Obtain the “Game Designer Subject” Certification

### Technical background

- Solid foundation in mathematics and physics
- Computer graphics, medical image processing, physical simulation, SLAM, Deep learning and other common algorithms
- C++, Python, Linux, OpenGL(HLSL), OpenCV, Fortran, ROS
- Unity 3D and Shader
- UE4 Material and Blueprint Development
- Related principles of PBR and DCC production tools
- Substance Designer Material Making
- Hand drawing ability (PS, Procreate, oil painting stick, sketch, watercolor, sketch)
- AI drawing tools: MJ and SD common workflows

## **Projects and Demos (see Jack's Pictures)**

### **Research and development of medical 3D Volume Rendering Engine (2011-)**

Lead the 3D visualization team to develop the company's first medical imaging visualization engine to meet the 3D visualization display needs of different medical imaging devices. Develop the core algorithm( RayCasting) based on OpenGL/HLSL and C++ and optimize the algorithm to meet the requirements of real-time 3D rendering of medical image data. Adding subsurface scattering effect to achieve realistic image rendering effect, using NVIDIA DLSS acceleration; supporting various complex interactive operations , such as splitting, hiding, group and etc..

### **Development of medical image VR/MR product prototype (2016-)**

Lead the team to develop product design, technical roadmap, research and development of the company's first generation of medical imaging VR products. The product is based on Zspace VR system, 3D visualization engine and post-processing application to realize VR display of real medical images (MR, CT). The prototype of the product was exhibited at the CMEF exhibition and was reported and noticed by the many medias. 2. Lead the team to develop Mixed Reality product demo based on HoloLens hardware. This product can render real medical image data and support interactive operation. It was also displayed at the CMEF exhibition and was reported by the industry medias.

### **Explore Medical Imaging 3D Printing Project (2018-)**

Lead the team to cooperate with 3D printing manufacturers to study the 3D printing method of human organs and provide supporting for surgical planning. It includes intelligent organ segmentation, 3D mesh modeling and rendering, and printing of brain nerve, heart and liver are realized. The relevant content participated in the CMEF conference and was reported by the industry media and the attention of peers.

### **Medical Post-Processing Algorithms (2011-2012)**

As an algorithm engineer, using C + +, develop colon segmentation algorithms, colon centerline extraction, and colon polyp CAD diagnosis algorithms. Through OpenGL shader language, the algorithm of nerve fiber and brain fusion display is developed. Intel IPP technology is used for acceleration. Relevant algorithms have been integrated into the released products. There are more than 10 related patents.

### **Computer Simulation of Water Drops (2010-2011)**

As a postdoctoral researcher, he proposed a deformable surface model to simulate the flow behavior of water droplets on different solid surfaces. In the Lagrangian coordinate system, at each time step, the implicit curvature flow operator is used to simulate the surface tension of water, the contact angle operator is used to change the shape of water droplets on the solid surface, and the topological structure of the mesh is optimized to improve the robustness of the mesh. Through a series of numerical experiments, it is proved that real-time rendering can be achieved. It was published in IEEE.

### **UE4 Game Project (2021-)**

FPS shooting game: Use UE4 to develop FPS shooting game with animation and scene resources to build game logic through UE4 blueprint. UE4 VR Laser Sword: Use UE4 and Oculus Quest 2 to develop VR Laser Sword games. Refer to BEAT SABER to implement game scenarios and logic.

### **Game 3D Modeling (2020-)**

Studying PBR and hand-drawing modeling workflow. It includes Maya, 3D Max, Zbrush, Substance Painter, Substance Designer, C4D, VRED and Monkey tool bag. In order to improve the art ability, I learned traditional art hand-drawing and AI drawing (MJ and SD).