Ruiliang Gao

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EDUCATION

University of Florida (UF)

- Ph.D. in Computer Engineering — Aug 2015 – Apr 2022
  - Research area: Computer Graphics, Physical Simulation, Virtual Reality, Human–computer Interaction
  - Advisor: Jörg Peters
  - Cumulative GPA: 3.82 / 4.00

University of Science and Technology of China (USTC)

- B.S. in Computational Mathematics — Sep 2011 – Jun 2015
  - Advisor: Ligang Liu
  - Cumulative GPA: 3.76 / 4.30 (top 10%)

RESEARCH AREAS

Computer Graphics Rendering & Composition, Physical Simulation, Mixed Reality, Human-computer Interaction

PROFESSIONAL& RESEARCH EXPERIENCE

Senior R&D Engineer, Immersive Experience Platform Lab, Samsung Research America, Mountain View — Jul 2022 – Now

- Develop XR Graphics Framework components
- Develop proof-of-concept prototypes for innovative AR/VR products

R&D intern, Kitware, Inc, North Carolina

- PBD and Pattern Cutting in iMSTK — May 2019 – Aug 2019
  - Improved the PBD cloth simulation in iMSTK and developed its real-time topology modification algorithm.
  - Modeled a pattern cutting surgical training application

PhD Candidate, SurfLab Research Group, University of Florida

- TIPSlite — Jun 2020 – May 2022
  - TIPSlite is our new cross-platform, cell phone based remote laparoscopy surgical training interface.
  - Developed the remote simulator, TIPS controller Android APP and part of the iOS APP
  - Tested, deployed and maintained the remote App manager and the thin client
- Elastoplasticity FEM modeling in surgery simulation — Oct 2020 – Jan 2022
  - Extended the existing elastic FEM-based methods in Simulation Open Framework Architecture (SOFA) to handle plastic deformation on hexahedral meshes, including both rotational and stretching plasticity.
- Toolkit for Illustration of Procedures in Surgery (TIPS) — Dec 2015 – Dec 2021
  - TIPS is a 3D interactive multimedia authoring and learning environment for communication of surgical procedures, which integrates three layers: 1) TIPS Simulator, 2) TIPS Artist, 3) TIPS Author
  - Implemented/improved several plugins in the Open Source SOFA-based TIPS Simulator, including the Haptic UI, physical simulation and rendering.
  - Developed several components for geometry modeling and physical modeling in Blender (Blender2SOFA).
  - Improved the TIPS Author to allow user preview, customize surgical procedures
- Structured Hexahedral Mesher — Jan 2018 – May 2018
  - Implemented a structured hexahedral mesher using grid-based and swapping-based techniques in our Blender plugin – Blender2Sofa. Improved the modeling of thick shell, thick-curve, hex-grid based human anatomies.

Undergraduate, Graphics&Geometric Computing Lab, University of Science and Technology of China

- 3D User Interaction based on Binocular Vision System — Jan 2015 – Jun 2015
  - Developed a binocular vision tracking system that incorporates the image capturing, camera calibration, object tracking and 3-D user interaction, based on OpenCV 2.0 and MATLAB Camera Calibrator
- 3D Iterative Mesh Deformation — Jul 2014 – Sep 2014
  - Implemented and compared several interactive Mesh Deformation methods including the Laplacian-based and Possion-based surface editing methods
- Unity3D Game Design — May 2014 – Jul 2014
  - Developed a 3D third person shooter game using Unity3D, *Zombie City*.
  - Worked on the characters, animation and storyline.

SKILLS

- Proficient in C/C++
- Familiar with Python, Java, MATLAB, OpenGL, Vulkan, WebGL, Blender3D, Unity3d, AbaqusCAE
- Language: Chinese (native); English (proficient)

PUBLICATION

[1] R. Gao and J. Peters, "Improving Hexahedral-FEM-Based Plasticity in Surgery Simulation," ***International Conference on Medical Image Computing and Computer-Assisted Intervention***, pp. 571–580, Springer, Mar 2021.

[2] R. Gao, S. Kurenov, E. W. Black, and J. Peters, "Adding Safety Rules to Surgeon-Authored Virtual Reality Training," ***Simulation in Healthcare***, pp. 400–407, Dec 2023.

[3] M. Sarov, R. Gao, J. Youngquist, G. Sarosi, S. Kurenov, and J. Peters, "An Authoring Interface for Surgeon-Authored VR Training," ***International Journal of Computer Assisted Radiology and Surgery***, pp. 1-4, Jun 2018.

[4] R. Gao and J. Peters, "Plastic hexahedral FEM for surgical simulation," ***International Journal of Computer Assisted Radiology and Surgery*** (IJCARS), pp.2183-2192, Dec 2022

TEACHING EXPERIENCE

- Teaching Assistant at the CISE department, UF — Sep 2015 – Apr 2022
- Lab mentor for SSTP program, CISE Department, UF — Jun 2017 – Sep 2018
  - Instructed the SSTP students to work on TIPS project and Blender
- Teaching Assistant at USTC — Feb 2015 – Jun 2015

CONFERENCE EXPERIENCE

- Conference presenter at MICCAI 2021 — Sep 2021
- Exhibitor at Academic Surgical Congress (ASC) 2020 — Feb 2020
- Exhibitor at ACS Clinical Congress 2019 — Oct 2019
- Co-reviewer for MICCAI 2020, 2021 — Mar 2019

SCHOLARSHIP& AWARDS

- Samsung Research America Star Award — Sep 2022, 2023
- Graduate assistantship from University of Florida — 2015 – 2022
- Excellent Student Scholarship Silver from Univ. of Sci & Tech. of China (top 10%) — 2011 – 2014
- National High School Mathematics League First Prize — 2010

[*CV compiled on 2024-07-14*]