

EDUCATION

Ph.D. in Computer Sciences

2015.Aug–2023.May (Expected)

University of Wisconsin – Madison, Madison, Wisconsin

- instructed by Prof. Eftychios Sifakis

BSc. in Computer Engineering

2011.Aug–2015.May

Georgia Institute of Technology, Atlanta, Georgia

WORKING EXPERIENCE

Engine Programmer

2021.Sep–2022.Jan

Lightspeed and Quantum Studio, Tencent America

- Prototyped a fluid backend based on shallow water equation for simulating large body of water

PUBLICATIONS

- **Wang, Q.**, Tao, Y., Cutting, C., and Sifakis, E. 2022. A computer based facial flaps simulator using projective dynamics. *Computer Methods and Programs in Biomedicine* 218, 106730.
- Murawski, E.L., Gawrych, E.H., Cutting, C.B., Sifakis, E.D., **Wang, Q.**, and Tao, Y. 2022. Long-Term Results of the Murawski Unilateral Cleft Lip Repair. *Plastic and Reconstructive Surgery* 149, 2, 254E-260E.
- Srinivasan, S.G., **Wang, Q.**, Rojas, J., Klár, G., Kavan, L., and Sifakis, E. 2021. Learning active quasistatic physics-based models from data. *ACM Transactions on Graphics* 40, 4, 1–14.
- **Wang, Q.**, Tao, Y., Brandt, E., Cutting, C., and Sifakis, E. 2021. Optimized Processing of Localized Collisions in Projective Dynamics. *Computer Graphics Forum* 40, 6, 382–393.

RESEARCH PROJECTS

FACIAL FLAP SIMULATOR

2021.Mar–Present

- A physically based virtual plastic surgery simulator focusing on operations on facial flaps
- Real-time simulation of interactions between skin flaps and tissue underneath with high resolution simulation grid
- Support medical operations including flap cut, undermine, hook, and sutures

LEARNING ACTIVE QUASISTATIC PHYSICS-BASED MODELS FROM DATA

2020.Feb–2021.Mar

- Aim to learn a low dimension control space from a set of example poses of an active deformable object (facial expressions)
- Utilized a differentiable quasi static physically based simulation layer with a decoder-type neural network
- Achieved good reconstruction on seen poses and generalized well to unseen poses
- Naturally enables addition of physical effects (gravity, collision, change of stiffness) to the constructed poses

OPTIMIZED PROCESSING OF LOCALIZED COLLISIONS IN PROJECTIVE

2019.Jan–2021.May

DYNAMICS

- Propose a new and distinctive approach to reconciling collision processing with the philosophy of Projective Dynamics.
- Optimized local steps and right hand side construction in global steps of projective dynamics with SIMD instructions and achieved simulation of 500K tetrahedron with interactive speed. (10 simulation frames per second)
- Presented in *A 70-Year History of Unilateral Cleft Lip Repair: A Simulator-Based Symposium*, ACPA's 77th Annual Meeting, 2020

HIERARCHICAL DIRECT SOLVER FOR LINEAR SYSTEM OF EQUATION

2017.May–2018.July

- Aim to develop direct solver for sparse linear system of equations originated from discretization of elasticity
- Subdivide physical domain to subdomains to save memory footprint and leverage parallelization

SKILLS

Programming Languages

C++, C, Python, CUDA, JAVA, Matlab, GLSL, Intel Intrinsics, OpenMP
Chinese (native); English (fluent); Japanese (Intermediate)