Qixin Deng

5740 Gulfton St., Houston, TX 77081

✉ qxdeng1991@gmail.com   ☐ (832)531-9817   ○ qixindeng.github.io

Education

University of Houston	GPA4.0	Computer Science	Ph.D	*01/2018 – 05/2023*
Purdue University	GPA3.7	Electrical & Computer Engineering	M.S.	*08/2015 – 05/2017*
ZhengZhou University	GPA3.8	Electronics Information Engineering	B.S.	*08/2010 – 05/2014*

Key Skills

Languages: C/C++, C#, Python, Matlab, java, JavaScript, HTML5
Tools: Tensorflow, Pytorch, Linux, Git, OpenGL, Maya, Unity, Wrap3D, CMake, QT, Visual Studio, Pycharm, Docker, SQL, NoSQL, MongoDB, Hadoop, AWS, Google Cloud Platform, Vue.js, Node.js
Keywords: Computer Graphics, Computer Vision, Deep Learning, 3D Face Reconstruction&Modeling, 3D Animation

Research Experience

End to End 3D Face Reconstruction with Expressions and Albedos from Single In the wild Images
CGIM Lab, University of Houston, Research Assistant   *Houston, TX, 05/2020 – 11/2021*
- Designed a deep learning based CNN model (**Resnet backbone**) with differentiable rendering procedure (**neural rendering**) to reconstruct face model from single in-the-wild images using **Python** on **Tensorflow** framework in **Linux** system.
- Developed a group of hybrid loss functions to train the model. The losses aimed to preserve identity(shape), constrain visual pleasure (albedo and lighting) and restore mouth expression.
- Implemented several face related technologies: **face recognition** network(FaceNet), **face segmentation** network (Unet), **face landmark detection** network, **face detection and alignment** network (MTCNN) and **Face Morphable Model**.

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Live Speech Driven Avatar-mediated Three-party Telepresence System: Design and Evaluation
CGIM Lab, University of Houston, Research Assistant   *Houston, TX, 08/2019 – 01/2021*
- Designed and developed an immersive telepresence system using **Unity&C#** in shared online virtual world in which users were able to customize outlook and drive **avatar** via live speech in real time.
- Proposed and implemented a method to generate head and eye motion in real time and use HMM and CRF model to synthesis body gesture in real time.

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Plausible 3D Face Wrinkle Generation Using Variational Autoencoders
CGIM Lab, University of Houston, Research Assistant   *Houston, TX, 01/2019 – 01/2021*
- Designed a deep learning based CNN model, which included a **Variational Auto-Encoder(VAE)** and a Supervised Network using **Python** on **Tensorflow** framework in **Linux system**, trained by proposed wrinkle edge aware loss. Displacement maps can be sampled and interpolated from the Lantent Space of the VAE model.
- Developed and implemented a framework using **C++** in **QT**, multiple libraries such as **Glut, Ceres, Opencv, OpenMesh** are compiled using **CMake**. The framework aimed to apply displacement map to face models with different topologies. An improved deformation transfer scheme and adaptive subdivision are developed and implemented.

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Deep Learning-Based Model for Head and Eye Motion Generation in Three-party Conversations
CGIM Lab, University of Houston, Research Assistant   *Houston, TX, 01/2018 – 04/2019*
- Designed a deep learning based **LSTM model** using **Python&Matlab** on **Tensorflow** framework in **Linux** system. The model can synthesize realistic three-party animation by feeding live speech. The generated motions include not only body motion, but also head and eye motion.

- Implemented motion controller and lip-sync technology to enrich animation results. Animation results are made by **Maya** software combined with **V-ray and Mental ray** renderers.

Work Experience

Design a Large Scale Distributed Web-API for User to Reconstruct Face Model
SEED Lab, Electronic Arts, Research&Development Intern, *Austin, TX, 05/2022 – 08/2022*
- Developed and implemented a **flask** based front-end, **k8s** based back-end web API using **JavaScript with HTML5 and Vue.js** framework for users to upload and reconstruct face model from single in-the-wild image.
- Built **dockers** to hold web server and deep-learning model for distributing deployment.
- Multiple functions were implemented, such as deep-learning model selection, images upload, results download, results rendering and data deletion.
- Developed a pipline using **Wrap3D** which aimed to do pre-alignment and non-rigit registration between our 3D model result and other face Rig(ex. EA FaceRig).

Teaching Experience

- COSC4370-**Interactive Computer Graphics** (lectures on OpenGL Programming), Fall 2022, Fall 2021, Fall 2020
- COSC6372-**Computer Graphics** (lectures on OpenGL Programming, Exam Review), Spring 2021, Spring 2022

Honors&Awards

Best PhD Award	Computer Science at University of Houston	*2022*
President Scholarship	Computer Science at University of Houston	*2018*
Outstanding Undergraduate Student	Education Department of Henan Province,China	*2014*
National Scholarship	Ministry of Education of China	*2012*

Publications

[1] **Qixin Deng** Aobo Jin, Binh Huy Le, and Zhigang Deng, "End to End 3D Face Reconstruction with Expressions and Specular Albedos from Single In the wild Images". Proceeding of ACM International Conference on Multimedia (MM) 2022 (**Best Conference in Multimedia**)

[2] **Qixin Deng**, Luming Ma, Aobo Jin, Huikun Bi, Binh Huy Le, and Zhigang Deng. "Plausible 3D Face Wrinkle Generation Using Variational Autoencoders."IEEE Transactions on Visualization and Computer Graphics (TVCG) 28.9 (2021): 3113-3125. (**Best Journal in Computer Graphics**)

[3] Aobo Jin, **Qixin Deng** and Zhigang Deng, "S2M-Net: Speech Driven Three-party Conversational Motion Synthesis Networks". Proceeding of ACM SIGGRAPH Symposium on Motion, Interaction, and Games (MIG) 2022, Guanajuato, Mexico, Nov 2022.

[4] Aobo Jin*, **Qixin Deng*** and Zhigang Deng, "A Live Speech Driven Avatar-mediated Three-party Telepresence System: Design and Evaluation". PRESENCE: Virtual and Augmented Reality, MIT press(2022).

[5] Aobo Jin, **Qixin Deng**, Yuting Zhang, and Zhigang Deng. "A Deep Learning-Based Model for Head and Eye Motion Generation in Three-party Conversations." Proceeding of the ACM on Computer Graphics and Interactive Techniques (PCM-CGIT), Special Issue for ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA) 2019, July 2019, 2(2), Article 9, pp. 9:1-9:19.