Junming (Leo) Chen

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Education

University of California, Berkeley, *M.Eng. CS*   *Aug.2024 – May.2025*
University of California, San Diego, *Exchange Student CS*; GPA: 4.0/4.0   *Mar.2023 – Jun.2023*
Northeastern University, *B.E. Honors Software Engineering*; GPA: 3.95/4.0   *Sep.2020 – Jun.2024*

Industry Experience

Machine Learning & Research Engineer Intern | DreamFlow AI Inc. - San Francisco, CA   *Apr.2024 – Jul.2024*

- Served as the primary contributor to an audio-driven talking face generation system, designing and implementing the core neural network architecture using the Diffusers framework that achieved state-of-the-art video synthesis quality.
- Directed the model training process and hyperparameter tuning through extensive experimentation to optimize the model's performance, enhancing video generation quality. Collaborated closely with team members to drive rapid prototyping.

Research Experience

Computer Vision & GenAI Research Assistant | **BAIR**, UC Berkeley   *Aug.2024 – present*
(Co-First authored) *3DHM: Synthesizing Moving People with 3D Control*

- Introduced a novel diffusion-based framework for Human Video Generation with precise 3D pose control, demonstrating superior resilience in generating prolonged and complex motion sequences with increased performance over existing methods.
- Design a disentangled approach for the view-invariant appearance representation and realistic rendering pipeline with 3D consistency.

Computer Vision & GenAI Research Assistant | Fusion Lab, Fudan University   *Jan.2024 – Apr.2024*
<u>ECCV 2024</u> (Co-First authored) *Champ: Controllable and Consistent Human Image Animation with 3D Parametric Guidance*

- Introduced a Controllable and Consistent Human Video Generation Framework by leveraging a 3D human parametric model within the diffusion model. Integrated a graphics pipeline that enables highly controllable editing on 3D humans.
- Enhanced 3D pose alignment and motion guidance by leveraging the unified representation of varying conditions offered by the SMPL model, significantly improving the capture of realistic human movements and shapes compared to baselines.
- Collected and produced a diverse human dancing dataset, significantly enhancing the model's capability to generalize complex motions and diverse scenes.

Computer Vision & Graphics Research Assistant | Université Laval   *Jul.2023 – Oct.2023*
Learning High Dynamic Range NeRF from Dual Cameras; **Advisor**: *Prof. Jean-François Lalonde*

- Proposed a Neural Radiance Field based framework and rendering pipeline to reconstruct the 3D HDR lighting for indoor scenes.

Computer Vision & Graphics Researcher | UC San Diego   *Apr.2023 – Jul.2023*
Creating 3D Virtual Dataset for Indoor Scenes; **Advisor**: *Prof. Manmohan Chandraker*

- Present a novel iterative approach for completing mesh's 3D part segment with only interactive 2D prompt point.

Publications

3DHM: Synthesizing Moving People with 3D Control   *In Review*
Boyi Li, **Junming Leo Chen***, Jathushan Rajasegaran*, Yossi Gandelsman, Alexei A. Efros, Jitendra Malik*

Champ: Controllable and Consistent Human Image Animation with 3D Parametric Guidance   *ECCV 2024*
Shenhao Zhu, **Junming Leo Chen***, Zuozhuo Dai, Qingkun Su, Yinghui Xu, Xun Cao, Yao Yao, Hao Zhu, Siyu Zhu.*

Opensource Projects

Champ: Human Video Generation   ⌂ 5K ★

- A Controllable and Consistent Human Video Generation Framework, implemented in Diffusers. Paper accepted in ECCV 2024.

Torrey: PBR Render Engine   ⌂

- A Path Tracer built only on C++ std library. Support various PBR materials and lights. Implement rendering algorithms from scratch, covering Multiple Importance Sampling, Bounding Volume Hierarchies, Image-based Lighting, Texture mapping, Mip mapping, etc.

Technical Skills, Awards

Languages: Python, C++, C, Java, Shell, LaTeX.

Technologies: PyTorch, Diffusers, Accelerate, Blender, Numpy, Pandas, sklearn, OpenCV, OpenGL, Docker, Git

Awards: UC Berkeley Ning Fellowship ($50K, highest)