SeungWon Jeong

Personal info

- 01/05/1998
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- seungwon@student.unimelb.edu.au

Links

- https://svvj.github.io
- /svvj
- /seung-won-jeong-ba149424a
- /SWJeong
- /seungwonjeong

Skills

- C++, C, Python, OpenGL, PyTorch, OpenCV, C#, CUDA, Javascript, Typescript, NodeJS, MongoDB
- Linux, Windows, Docker
- VS, VS Code, PyCharm, CLion
- Blender, Photoshop, Premiere Pro

Languages

- Korean (Mothertounge)
- English (TOEFL iBT 88)

Education

University of Melbourne (PhD Candidate)

Melbourne, Australia Aug 2024 – Continue

Research Topic: Computer Graphics & Computer Vision

Thesis: A Hybrid Iterative Algorithm for Solving Constraint Optimization Problems

Korea University (Master's Degree, [Link])

Seoul, South Korea Mar 2022 – Feb 2024

Grade: 4.11/4.5 (95.5%)

Major: Artificial Intelligence Applications

Research Topic: Computer Graphics (Physics-Based Simulation)

Thesis: A Hybrid Iterative Algorithm for Solving Constraint Optimization Problems

Korea University (Bachelor)

Seoul, South Korea Mar 2016 – Feb 2022 (Including military service)

Grade: 3.65/4.5 (91.5%)

Major: Computer Science and Engineering

Subsidiary subject: Interdisciplinary Major in Artificial Intelligence (Interdisciplinary Program)

Daejeon Science High School

Daejeon, South Korea Mar 2013 – Feb 2016

Major: Computer Science & Astronomy

Work Experience

Research Engineer

Full-time, Next-generation Virtual and Augmented Reality Research Institute, Korea University, [Link]

Mar 2024 – Aug 2024

- Research Team Leader
  - Led research to improve the Digital Human project

Teaching Assistant

Part-time, Computer Graphics Course, [Link]

Mar 2022 – Jul 2022

- Programming Assignment Creation
  - Implementation of Character Animation and Ray Tracing Assignment Based on OpenGL

Backend Developer

Part-time, Joanholab co., [Link]

Nov 2019 – Jun 2020

- Team Manager & Backend Developer
  - Login authentication system
  - User database management
  - Backend programming and deployment

Republic of Korea Army

Full-time, Compulsory Service

Mar 2018 – Nov 2019

- Tactic Server Administrator
- Server Management and Communication Tasks
- U.S.-South Korea Joint Military Exercise (2019)

Thesis and Paper

Superpixel-guided Sparse Gaussian Splatting for Compact Scene Representation
MyoungGon Kim, **SeungWon Jeong**, Seohyeon Park, JungHyun Han

Korea University 2024 **VRST**

Improved the optimization phase in Gaussian Splatting by adjusting the initial conditions of 3D Gaussians, resulting in enhanced convergence speed.

I contributed to conceptualizing research ideas and executing comparative analyses of various models, significantly advancing my expertise in View Synthesis.

A Hybrid Iterative Algorithm for Solving Constraint Optimization Problems
SeungWon Jeong

Korea University 2023 Master's Thesis

In my Master's thesis, I focused on developing advanced algorithms for constraint optimization in computer graphics, partic ularly emphasizing the enhancement of numerical solutions and the effective integration of Gauss-Seidel and Jacobi methods.

This research deepened my understanding of complex algorithmic strategies, equipping me with the skills to innovatively address and solve challenging computational problems in the field.

Awards

Professional Manpower Training for VR·AR Research Contest
Best Research Award, Korea Electronics Association

2023

Projects

Digital Human Project
Korea University 2023 Python, PyTorch, Taichi Lang, OpenGL, OpenCV, Blender, LaTeX

Using physics-based simulations, we developed a real-time deep-learning model to create virtual human characters from RGB camera footage, complete with realistic virtual clothing.

My role involved developing parallel algorithms for efficient cloth simulation processing, creating a renderer (calculating pixel color values without using libraries like OpenGL), and modeling the virtual clothing with Blender. I also integrated the outputs of the SMPL model with cloth simulations to enhance the interaction and realism of the virtual characters.

Physics-Based Simulation Framework
Korea University 2023 C++, OpenGL

Developed a comprehensive simulation framework, encompassing everything from OBJ file I/O to the implementation of simulation solvers and a renderer. This project involved creating a robust platform for conducting detailed physics-based simulations, providing a full suite of tools for efficient and accurate modeling.

Differentiable Flag
Korea University 2021-2022 Python, PyTorch, OpenCV, PyTorch3D, LaTeX

Utilized a differentiable physics simulator to train a deep learning model, enabling it to learn and output simulation parameters for creating desired flag movements from RGB camera-captured data and 3D reconstructions.

My role in this project was to implement the deep learning model and the differentiable physics solver. Additionally, I was responsible for generating 3D flags from 2D video footage of fluttering flags, which served as the basis for the model's training data.

Outsourcing Website Production [Link]
Joanholab co. 2019-2020 Typescript, NodeJS, MongoDB, Linux, Docker

As Web Development Team Leader, I managed communications with the principal contractors and coordinated task distribution among team members.

As a Backend Developer, I implemented a secure login system, oversaw user database management, and led backend programming and deployment.

Scholarships

Student Creative and Independent Project Grant
About **USD$7,500**, ITRC(Information Technology Research Center) Support Program

2022

My **"Differentiable Flag Project"** was supported by Ministry of Science and ICT, Korea, under the ICT Creative Consilience Program, ITRC (Information Technology Research Center) Support Program.

Dang-Rim Scholarship
About **USD$2,300**, Dang-Rim Scholarship (External Scholarship)

2021

Full Scholarship Throughout Undergraduate Studies
About **USD$13,000** in total, National Grant

2016-2017, 2020-2021