

Xinran Tao

Computer Science Postgraduate

I'm a Computer Science postgraduate student at EPFL with an interest in Computer Graphics, Machine Learning and Software Engineering.

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🌐 github.com/theBoilingPoint

EDUCATION

Master of Engineering (MSE) Computer Graphics and Game Technology (CGGT)

University of Pennsylvania

01/2024 - Present

Master of Science (MSc) Computer Science Specialised in Signals, Images and Interfaces

École Polytechnique Fédérale De Lausanne (EPFL)

09/2021 - 01/2024

EPFL GPA: 5.13/6.00

Achievements

- Focus on Computer Graphics and Rendering
- Relevant Modules: Advanced Computer Graphics, Machine Learning, Database Systems, Image Processing, Computational Photography, Data Visualisation, Information Security and Privacy

Bachelor of Science (Hons) Computer Science with Artificial Intelligence

King's College London

09/2018 - 09/2021

GPA: 4.00/4.00

Achievements

- First-class Graduation
- Received King's Research Award
- Relevant Modules: Machine Learning, Data Structures, Software Engineering, Computer Systems

TECHNICAL SKILLS

Programming Languages

Java, C++, Scala, Python, C#, JavaScript, TypeScript, Dart, HTML, XML, CSS, SQL, PDDL

Frameworks & Tools

React.js, Flutter, Android Studio, Docker, Jupyter Notebook, git, LaTeX, JetBrains, Visual Studio, Figma, Blender, CMake

WORK EXPERIENCE

Angular Frontend Development

Beyond Gravity

07/2023 - 08/2023

Lausanne

Achievements/Tasks

- Successfully migrated critical features, including the colour scale and label readjustment, to the modern Angular framework, optimizing performance and functionality.
- Elevated visual appeal and user experience by implementing design improvements while ensuring code readability through consistent styling and comprehensive documentation.
- Effectively communicated project progress through engaging presentations, providing in-depth explanations of algorithms and presenting a clear class diagram for enhanced comprehension.
- Collaborated closely with the project manager to align deliverables with customer requirements, fostering seamless workflow management through Git version control.

Reference: Mathias Burkhalter - mathias.burkhalter@beyondgravity.com

WORK EXPERIENCE

Research Intern on Generative Adversarial Networks for Game Assets

University of York

07/2021 - 09/2021

Yorkshire, UK

Achievements/Tasks

- Conducted a comprehensive comparative study of four prominent GAN architectures: Cycle GAN, AdaIN, Lapstyle, and Deep Photo Style, showcasing expertise in generative modeling techniques.
- Skillfully optimized codebases for all four architectures to ensure seamless compatibility with the latest Python environment, underscoring adaptability and proficiency in software development.
- Adapted original GAN architecture implementations to support efficient training scripts, demonstrating a knack for refining and streamlining complex algorithms.
- Delivered innovative solutions for rapid and cost-effective art asset generation, addressing the specific needs of Revolution, a gaming company, and contributing to streamlined production processes. This showcases an ability to provide practical, value-driven solutions in a professional setting.

Reference : Dr. James Walker - Dr. Simon Demediuk

PERSONAL PROJECTS

Master's Thesis: Neural Inverse Rendering on Glinty Materials (09/2023 - 01/2024)

- Generated a high-fidelity glinty material dataset utilising self-authored physically-based rendering code in C++, ensuring accuracy and realism.
- Developed a differentiable glinty material reconstruction method in the neural inverse rasterisation context, being the first project to achieve such an objective.
- Conducted extensive experiments to consolidate the high visual the numerical qualities of the proposed method.
- Authored a detailed project report, encapsulating background research, methodologies, and outcomes, and delivered a compelling presentation to showcase the work's significance and contributions.
- Reference: Prof. Sabine Süssstrunk, sabine.susstrunk@epfl.ch

Advanced Computer Graphics: Physically-based Rendering Project (02/2022 - 06/2022)

- Implemented a photo-realistic glints effect using a discrete microfacet model and a stochastic algorithm, enhancing visual fidelity and realism in rendered scenes.
- Implemented a texture mapping feature, employing a diffuse BSDF model to enhance surface appearance and material interactions.
- Implemented depth of field in the camera system, refining focus and enhancing visual depth for more compelling renderings.
- Authored a detailed 3,000-word report, providing thorough theoretical and practical validations for each implemented feature, showcasing a deep understanding of the underlying principles and their effective application.
- Reference: Prof. Wenzel Jakob, wenzel.jakob@epfl.ch

Unity VR Game Development: VR Ninja (02/2022 - 05/2022)

- Orchestrated the creation of four distinct game levels, including tutorial, village traversal, puzzle solving, and a thrilling boss encounter, ensuring engaging player progression.
- Implemented an exhilarating Ninja action game using Oculus Unity API, enabling players to execute dynamic actions like slashing, throwing, grabbing (both close-range and remote), and teleporting for an interactive gaming experience.
- Implemented user-friendly features, including locking the camera view during teleportation, effectively mitigating cyber-sickness concerns and ensuring seamless immersion.
- Conducted rigorous testing and fine-tuning of game parameters to achieve optimal difficulty balance, enhancing player engagement and satisfaction.

BSc Dissertation: Full Stack Contact Tracing App with Simplified WiFi Fingerprinting Model (09/2020 - 06/2021)

- Conducted a comprehensive study of the Bluetooth-based frameworks utilized in contemporary COVID contact tracing applications, gaining a deep understanding of their functionalities and applications.
- Pioneered the development and assessment of a streamlined WiFi fingerprinting model, offering an alternative approach to contact tracing, showcasing creativity and problem-solving skills in epidemiological contexts.
- Programmed a dynamic Android application, integrating the advanced WiFi fingerprinting model, using Flutter for the frontend and Firebase for backend functionalities. This demonstrated proficiency in mobile app development and database management.
- Employed rigorous software engineering principles to enhance the app's performance, demonstrating a commitment to producing high-quality, efficient solutions for complex challenges.
- Reference: Dr. Andrew Coles, andrew.coles@kcl.ac.uk

LANGUAGES

English

Native or Bilingual Proficiency

Chinese

Native or Bilingual Proficiency