BENJAMIN KAHL

Résumé

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Summary

I am an experienced game programmer with a strong background in C++, C#, and computer graphics. My passion for visual storytelling and video games has driven me to develop games both as a hobby and as a profession.
Through a mixture of self-teaching, academic education, and professional experience, I've garnered a wide skillset overarching much of the game-development and game-design stack.
I am excited to take this passion further and enter the games industry.

Skills

Over 10 years of programming experience with C++ and C#.

5+ years of hands-on development with Unity and Unreal Engine.

Strong understanding of mathematical concepts and practical details of rendering-pipelines, shaders and GPUs, including experience with HLSL and GLSL.

Adept in image editing, UX design, texturing, and 3D modelling using Photoshop and Blender.

Complementary knowledge with Python, Git and LaTeX.

Work Experience

12/2024–present
Research Scientist
Fraunhofer IOSB · Full-Time
- Developed data processing and aggregation tools for point-cloud and image data using C++/CUDA, Python/Pytorch and C#.
- Created Neural Fields and Gaussian Splats from image data using available commercial and internal tools.

12/2022–12/2024
VR Developer
Max-Planck Institute for Human Development · Full-Time
- Developed and co-designed VR-based cognitive studies from inception to completion using Unity and C#
- Integrated cutting-edge technologies such as Wavefield-Synthesis, full-body 3D scanners, and hand/eye tracking into studies
- Built frameworks and libraries for multiplayer networking, runtime-scripting languages and data collection

10/2022–present
Freelance Software Developer
Self-Employed · Part-Time
- Implemented or improved various research projects primarily using Unity and C#
- Consistently high rate of customer satisfaction, including support for the projects long after completion.
- Notable Clients: Bern University, Max Planck Institute for Human Cognitive and Brain Sciences, Potsdam University

11/2021–12/2022
Research Assistant
Science of Intelligence / TU Berlin · Part-Time
- Delivered technical solutions to several different projects at the SCIoI Cluster of Excellence
- Specialized in multiplayer games focusing on collective intelligence and modeling foraging behavior in realistic environments

10/2019–11/2021
VR Developer
Max-Planck Institute for Human Development (ARC) · Part-Time
- Developed and implemented VR cognitive studies using Unity, Unreal Engine, Python (OpenSesame) and Java (Minecraft)
- Introduced new, self-made rendering software for recording, analyzing and evaluating scientific data
- Co-authored research papers and assisted in data analysis with Python scripts and GPU-based visibility simulations
- Built software frameworks and modules to facilitate VR game development

3/2017–6/2017
Full-Stack Developer
Futurice · Internship
- Developed internal web tools using Django and Python
- Designed front-end interfaces with HTML, CSS, and JavaScript
- Integrated back-end systems with PostgreSQL databases

Languages

German — Native Tongue
English — Fluent (IELTS 8.5)
Spanish — Fluent
Finnish — Fluent

Education

9/2018—11/2022
Computer Science
Freie Universität Berlin · Master of Science
- **Relevant courses:** Computer Graphics, Algorithmic Geometry, Machine Learning, Software Project: Computational Geometry, Software Project: Unity Simulator
- **Thesis title:** *Hardware Acceleration of Progressive Refinement Radiosity using Nvidia RTX*
  Thesis mark: 1.0 (GPA: 4.0)
- **Overall mark:** 1.3 (GPA: 3.7)

9/2014—3/2019
Computer Science
Freie Universität Berlin · Bachelor of Science
- **Relevant courses:** Compiler Development, Non-sequential Programming, Object-oriented Programming
- **Thesis Title:** *Real-Time Global Illumination Using OpenGL and Voxel Cone Tracing*
  Thesis mark: 1.0 (GPA: 4.0)
- **Overall mark:** 2.3 (GPA: 2.7)

9/2013—9/2014
Chemistry
Freie Universität Berlin · Bachelor Studies
- Lab traineeship and courses on mathematics, physical chemistry and scientific presentations
- **Average mark:** 3.0 (GPA: 2.0)

2001–2013
High School Graduation
Deutsche Schule Madrid · Abitur / Gymnasium
- **Language classes:** German, Spanish (native speaker level), English, French
- **Abitur examination:** German, Spanish, Mathematics and Chemistry
- **Overall mark:** 1.9 (GPA: 3.1)

1999–2007
Weekend Schooling
Finnish School of Madrid ·
- Classes on Finnish language, culutre and history

Publications

2025
Adaptive mechanisms of social and asocial learning in immersive collective foraging
Nature Communications · Wu, C.M., Deffner, D., Kahl, B. et al.
DOI: s41467-025-58365-6

2023
Collective incentives reduce over-exploitation of social information in unconstrained human groups
Nature Communications · Deffner, D., Mezey, D., Kahl, B., Schakowski, A., Romanczuk, P., Wu, C. M., et al.
DOI: 10.1038/s41467-024-47010-3

2023
Visual-spatial dynamics drive adaptive social learning in immersive environments
Preprint · Wu, C. M., Deffner, D., Kahl, B., Meder, B., Ho, M. H., & Kurvers, R. H. J. M.
DOI: 10.1101/2023.06.28.546887

2022
Hardware Acceleration of Progressive Refinement Radiosity using Nvidia RTX
Master's Thesis · Kahl, B
DOI: 2303.14831

2021
Specialization and selective social attention establishes the balance between individual and social learning
Preprint · Wu, C. M., Ho, M. K., Kahl, B., Leuker, C., Meder, B., & Kurvers, R. H. J. M.
DOI: 10.1101/2021.02.03.429553

2019
Real-Time Global Illumination Using OpenGL And Voxel Cone Tracing
Bachelor's Thesis · Kahl, B
DOI: 2104.00618

Projects

Hearts of Iron IV - Lord of the Rings Mod

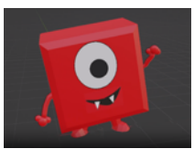
`steamcommunity.com/sharedfiles/filedetails/?id=1314446921`

A full-conversion mod bringing the world of Lord of the Rings into the game of Hearts of Iron 4. Currently has over 100.000 active subscribers, over 8000 favourites as well as an active and thriving online community. I have served as it's lead developer since its inception, having developed the majority of content myself.

CoinScrounge

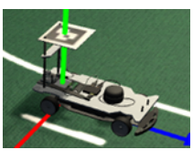
`github.com/DominikDeffner/VirtualCollectiveForaging`

Unity-based multiplayer game modelling dynamically-interacting individuals in human collectives in realistic environments.
The final manuscript of our findings was accepted for publication in nature communications.



Runner's Study

VR game used to investigate whether embedding the learning process in performing instrumental actions can help with the learning of cue-outcome relationships in young children.
Custom-built levels and self-animated characters to ensure a child-friendly environments, and utilization of eye-tracking data to interact with the experiment.



AutoModelCar Simulator

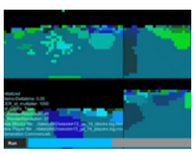
`github.com/Helliaca/AutoModelCar_Simulator`

Unity3D simulator of the AutoNOMOS robot-cars that are used at the Freie Universität Berlin. Allows a user to seamlessly connect a ROS environment and control virtual robots that behave much like the real ones, but also include insightful debugging-data.

ARC-VR

`vr-toolbox.org`

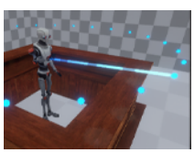
A Unity framework for the development of VR-based cognitive and/or behavioral studies. Built from the ground up, using only OpenXR as a dependency, including many fundamental VR features such as movement, physics, avatars, UI-interactions etc. in an extremely modular manner.
I held a much-praised talk showcasing it at the MPIB.



ProducerScroungers

`github.com/charleywu/minecraftforaging`

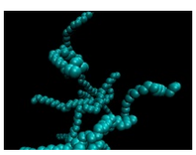
A behavioral study modelling collective intelligence in foraging tasks using Minecraft for the underlying environment. Using Unity-based simulations we were able to recreate each participants visual fields to combine analysis of spatial trajectories and visual field data.



WFS-VR

(ongoing)

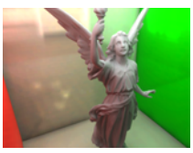
A VR research-project created to determine the perceived accuracy of sound-sources using wave-field-synthesis setups. Leverages features such as passthrough-VR and hand-tracking to their fullest extent, providing a smooth and intuitive control scheme intended to be used with a wide range of participants.



GROMACS-bash

`github.com/Helliaca/gromacs-bash-script`

A bash-based framework to intuitively run Gromacs and Packmol-based molecular dynamics simulations in an organized manner.



RTRad

`github.com/Helliaca/RTRad`

A C++ implementation of progressive refinement radiosity uniquely leveraging Nvidia's RTX technology to GPU-accelerate visibility calculations.
Built on Falcor 4.4, using a highly configureable DirectX 12 render-pipeline, the development took place as part of a Masters's thesis at the Freie Universität Berlin.

VXCT

`github.com/Helliaca/VXCT`

An OpenGL-based C++ implementation of the Voxel Cone Tracing lighting algorithm as part of a Bachelor's Thesis. Highly customizable and educational on the inner workings of the algorithm.
The underlying thesis has been cited several times, and the open-source codebase used for several derivative projects.

RCAS

A Unity framework enabling remote control of mobile VR applications from a smartphone or computer, in addition to streaming a live-view of the headset's FOV and allowing recorded data to be retrieved from the headset. Developed as a freelance project for the Max Planck Institute for Human Cognitive and Brain Sciences.