Aritra Bhakat

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Education

Aug 2022–Dec 2024 **Master's Programme in Computer Science**, *Visualisation and Interactive Graphics Track*, KTH Royal Institute of Technology, Stockholm

Aug 2019–Dec 2024 **Degree Programme in Engineering Physics**, KTH Royal Institute of Technology, Stockholm
GPA 4.75/5

Jul 2022–Nov 2022 **Exchange Studies**, *Computer Science*, University of Melbourne, Melbourne, Australia
81.5% WAM

Work experience

2021–Present **Technical support, part time**, PrBh Redovisningsbyrå AB, Stockholm
Roles:
- Technical support with accounting and other software
- Implementing solutions to automate accounting workflow
- Building and maintaining website

Summer 2020 **Summer research project**, NORDITA, Stockholm
- Implemented an interactive visualisation for time-dependent data from an asteroid erosion simulation.
- Visualisations were published in the resulting paper.

Skills

Languages	C++, C#, Java, Javascript, GLSL, HLSL	**Graphics APIs**	OpenGL, Vulkan
GPGPU	CUDA, Compute shaders	**Scripting**	Python, MATLAB
Parallel/ distributed	Slurm, MPI, OpenMP	**Misc/ software**	Git, Bash, CMake, Unity, COMSOL

Projects

Feb 2024–Dec 2024 **Master thesis: Approximate Opacity Optimisation**, *C++, OpenGL, GLSL*
Implemented a visualisation algorithm which helps reveal important data in dense 3D geometry. Used approximation methods to improve performance.

Nov 2024–Feb 2024 **Vulkan Path Tracer**, *C++, Vulkan, GLSL*
Physically based path tracer in Vulkan utilising hardware accelerated ray tracing. Implemented multiple importance sampling, with direct light sampling and material BSDF sampling for faster convergence. Implemented a comprehensive material model.

May 2023 **Soft Body Simulation**, *Unity, C#, HLSL*
A GPU soft body simulator. Implemented in compute shaders using the XPBD method, with graph colouring to cluster independent constraints.

Nov 2023–Jan 2024 **Isosurface renderer with implicit kD-trees**, *C++, OpenGL, GLSL*
An isosurface renderer using implicit kD-tree to skip space and quickly evaluate intersections, implemented on the GPU.

Sep 2023–Oct 2023 **Rolling Reactions VR**, *Unity, C#*
Implemented wheelchair physics and integrated a fluid simulation for a VR group project: a VR experience where the player moves in a wheelchair and performs chemistry experiments.

Volunteering

2019–Present **Djurgårdens IF Cricketförening**, *Cricket club*, Stockholm
- Board member
- Youth section: coaching U15 and U19 teams, organising tournaments, applying for grants, administration
- Senior teams: running training sessions, captaining the 1st XI team, organising equipment orders

Nov 2022–Feb 2023 **Brunswick CC**, *Cricket club*, Melbourne, Australia
- Coaching in the *Woolworths Cricket Blast* U10 programme

Languages

Fluent Swedish, English, Bengali

Basic French, Hindi