Barney (Barnabás) Börcsök

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Education

Georgia Institute of Technology — **Atlanta, GA**
M.S. Computer Science — *Aug. 2023 – May 2025*
- Advisor: Prof. Bo Zhu, co-advised by Prof. Greg Turk
- Research focus: Machine Learning in Computer Graphics
- Thesis title: Differentiable 3D Scene Representations with Point-based Neural Methods

Budapest University of Technology and Economics — **Budapest, Hungary**
B.S. Computer Science Engineering — *2018 – 2023*
- Advisor: Prof. László Szécsi - Specialization in Computer Graphics
- Thesis title: Reduced Order Modeling of Fluid Dynamics (Controlling 2D Laplacian Eigenfluids with Differentiable Physics)

Technical University of Munich — **Munich, Germany**
Erasmus Exchange Student – Department of Informatics — *2021 – 2022*
Completed two semesters of exchange studies at TU Munich, specializing in advanced computer graphics and deep learning research.
- 1st semester: Rendering Participating Media (seminar presentation)
- 2nd semester: Deep Learning in Physics (seminar presentation)

Teleki-Wattay School of Music and Arts — **Pomáz, Hungary**
Art Student (Guitar and Theater Faculty) — *2010 – 2020*

Selected Work Experience

Adobe — **San Jose, CA**
Machine Learning Engineer (Drawing & Painting) — *Jul. 2025 – Present*
Software Development Engineer Intern (Computer Graphics) — *May – Aug. 2024*
- 2D Image and Geometry processing

Dassault Systèmes 3DEXCITE — **Munich, Germany**
Software Engineer Intern — *Apr. – Sept. 2022*
R&D Technologies, Rendering and Appearance Infrastructure Department
- Collaborated closely with an in-house artist to develop a new 3D material editor, improving workflows for creating Physically-Based Rendering (PBR) materials used in testing Dassault Systèmes' proprietary renderer.

Budapest University of Technology and Economics — **Budapest, Hungary**
Graduate Research and Teaching Assistant – 3D Computer Graphics — *Feb. – Jul. 2023*
- Led exercise sessions, graded homeworks and presented the lecture on volumetric rendering.
- Research topic: physics-based deep learning, with a focus on reduced-dimensional fluid simulations.

Undergraduate Teaching Assistant – Programming 1 — *Fall 2020/21*
Undergraduate Teaching Assistant – System Modelling — *Spring 2019/20*

Camp Kinder Ring — **New York**
Boy's side counsellor — *Summer 2019*
- Sleep-away camp in upstate New York.

Skills and Interests

Computer Graphics: Differentiable Scene Representations, Simulation, Rendering, Machine Learning Methods

AI: Deep Learning, Physics-based Deep Learning, Scientific Machine Learning, Computer Vision

Programming: C, C++, Python, PyTorch, LaTeX, OpenGL, WebGL, Web Development (HTML, CSS, JavaScript)

Software Tools: Linux, Git, macOS, Microsoft Office

Selected Talks & Honors

Guest Lectures at Georgia Tech for "Computer Graphics in AI Era" (Prof. Bo Zhu):
- Differentiable Physics & Neural Networks (Spring 2025) — https://youtu.be/F5usbFOWvz4
- 3D Gaussian Splatting (Spring 2025) — https://youtu.be/MBVmQSA24Yk

Guest Lecture at TU Budapest – 3D Computer Graphics, Prof. László Szécsi:
- Volumetric Rendering (Spring 2023)

Naumann-Etienne Foundation: Full-Ride Scholarship for M.S. at Georgia Tech

Nokia Young Scientist Award: from Nokia Bell Labs (July 2023).
- Invited talk at Nokia Skypark (Budapest): "Controlling Laplacian Eigenfluids using Differentiable Physics".

Student scholarship: from Shapr3D (May-July 2023)

Hungarian Students' Scientific Conference (TDK) 2022: 1st place, with distinction
- Topic: Controlling 2D Laplacian Eigenfluids with Differentiable Physics
- Qualified to the 36th National Conference of the Scientific Students' Associations (OTDK, special award).

Scholarship of the Faculty of Electrical Engineering and Informatics: TU Budapest

Selected Projects & Publications **https://barney.graphics/projects**

Lagrangian Covector Fluid with Free Surface
- Authors: Zhiqi Li, **Barnabás Börcsök**, Duowen Chen, Yutong Sun, Bo Zhu, and Greg Turk.
- Accepted to **ACM SIGGRAPH 2024** Conference Papers (SIGGRAPH '24)
- https://dl.acm.org/doi/10.1145/3641519.3657514

Controlling 2D Laplacian Eigenfluids with Differentiable Physics (Fall 2022) *[Python, Φ_{Flow}, PyTorch]*
- 27th Central European Seminar on Computer Graphics (CESCG, **3rd Best Presentation Award**)
- See https://github.com/bobarna/eigenfluid-control.

Automatic Number Plate Recognition (Fall 2022) *[Python, PyTorch, OpenCV]*
- **1st place** in the semester's group homework competition for the Image Processing class at TU Budapest.
- See https://github.com/bobarna/bme-image-processing.

Simulation of Curly Hair (Fall 2020) *[C++, OpenGL]*
- Implemented a curly hair simulation system using the Position Based Dynamics (PBD) method. [Project Summary]

Interactive Voronoi Diagram (Fall 2019) *[C++, SDL2]*
- Code available at https://github.com/bobarna/voronoi.

Vocational & Volunteering

SIGGRAPH 2023 **Los Angeles, CA**
Student Volunteer Team Leader *Aug. 2023*

SIGGRAPH 2022 **Vancouver, BC**
Student Volunteer *Aug. 2022*

Simonyi Károly College for Advanced Studies **Budapest, Hungary**
Leader of Schönherz Design Studio (schdesign) *2020 – 2021*
Active Member *2019 – 2023*

TUM.ai **Munich, Germany**
Active Member, Education Department *2021 – 2022*

Teleki-Wattay School of Music and Arts **Pomáz, Hungary**
Child care, instructing (Guitar Summer Camp) *Summer 2018*

Other Highlights

Language Skills: English (proficient), German (intermediate), Hungarian (native)

CG Papers & Chill Podcast: Talking about Computer Graphics papers with friends for fun. *[YouTube link]*