Ali Can **Demiralp**

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Experience

The Qt Company
Berlin, Germany

Specialist Software Engineer — *January 2024 - Current*

- Contributing to the development and maintenance of Qt's Visual Studio extension.

RWTH Aachen, Virtual Reality and Immersive Visualization Group
Aachen, Germany

Scientific Staff and Ph.D. Candidate — *January 2017 - December 2022*

- Assisted and performed independent research on the topics of scientific visualization, high-performance computing and numerical analysis, under the supervision of Prof. Torsten Wolfgang Kuhlen.
- Contributed peer-reviewed publications & software to the *Human Brain Project (HBP)* and the *Nationales Hochleistungsrechnen (NHR)* program. *(See the Publications section, github.com/vrgrouprwth, and git-ce.rwth-aachen.de/vr-vis for detail.)*
- Modernized the software infrastructure of *AixCAVE at RWTH Aachen*, a room-mounted virtual reality environment, transitioning it from the Vista Virtual Reality Toolkit to Unreal Engine.
- Developed immersive visualization applications targeting the *AixCAVE* and standard head-mounted displays using Unreal Engine, in collaboration with the *Institute for Combustion Technology* and the *Ophthalmology Clinic of the University Hospital*.
- Developed distributed, hybrid-parallel visualization applications using MPI and CUDA/OMP/TBB, focusing on particle and relativistic ray tracing, targeting the *CLAIX Compute Cluster of RWTH Aachen* and the *JURECA of Jülich Supercomputing Center*.
- Developed scientific visualization applications targeting standard desktops using Qt and VTK(m), focusing on visualization of nerve fibers within the brain, in collaboration with the *Jülich Research Center Institute of Neurosciences and Medicine*.
- Contributed to various open-source projects including Bluebrain HighFive, Cppcheck, Eigen, Microsoft Vcpkg, Nvidia VisRTX, Nvidia VkHLF, Unreal Engine nDisplay Plugin, and many others.

RWTH Aachen, Virtual Reality and Immersive Visualization Group
Aachen, Germany

C++ Developer - Scientific Visualization — *February 2016 - December 2016*

- Developed the graphical and statistical features of *Performance Visualization Toolkit (PVT)*, an open-source C++ library for visualizing the performance of MPI applications.

Fraunhofer Institute for Applied Information Technology (FIT)
Sankt Augustin, Germany

C++ and Java Developer - Internet of Things (IoT) — *February 2014 - June 2015*

- Developed a mobile ad-hoc emergency notification system, and the firmware of a Bluetooth low energy pulse detection bracelet, for the *Bridging Resource and Agencies in Large-Scale Emergency Management (BRIDGE)* European Union project.
- Developed an automotive construction pipeline demo for the *Enabling Business-Based Internet of Things and Services (EBBITS)* European Union project.

Tart New Media
Istanbul, Turkey

Unity Developer — *February 2013 - August 2013*

- Developed the multiplayer features and user interface of *Kixel*, a football game for Facebook.

Chyron
Melville, New York, USA

Intern C++ Developer - Computer Graphics — *May 2012 - August 2012*

- Developed the Alembic and Collada asset importers of *Chyron Lyric PRO*, a broadcast graphics creation tool.

Grupanya
Istanbul, Turkey

Intern Web Developer — *June 2011 - August 2011*

- Developed a typographical error checker, and a tool for matching users to potential offers for *Grupanya*, a local e-commerce website.

Education

RWTH Aachen
Aachen, Germany

M.Sc. in Media Informatics *(Applied Computer Science)* — *September 2013 - November 2016*

Overall GPA: 2.1/5.0. Thesis GPA: 1.3/5.0. *(Maximum grade: 1.0)*

Stony Brook University
Stony Brook, New York, USA

B.Sc. in Computer Science — *September 2009 - December 2012*

Overall GPA: 3.64/4.00. Graduation with honor (Cum Laude). *(Maximum grade: 4.00)*

Programming Languages

C++	08 years of professional, 14 years total experience. Important libraries: Boost, STL 03/11/14/17/20/23.
CUDA	07 years of professional, 08 years total experience. Important libraries: Nvidia cuSolver, Nvidia OptiX, Nvidia Thrust.
C#	Important libraries: Unity SDK, Unreal Build System.
Java	Important libraries: Android SDK, Arduino SDK.
JavaScript	Important libraries: AWS SDK, D3.js, Three.js, WebGL.
Python	Important libraries: Matplotlib, NumPy, Pandas, SciPy.

Technologies

Game Engines	Unity, Unreal Engine
Graphics APIs	Intel OSPRay, Nvidia OptiX, OpenGL, Vulkan
Numerics APIs	Eigen, GNU GSL, Intel MKL, Nvidia cuSolver
Parallelization APIs	Intel TBB, MPI, Nvidia CUDA, Nvidia Thrust, OpenCL, OpenMP
User Interface APIs	ImGui, Qt
Virtual Reality APIs	OpenVR, OpenXR
Visualization APIs	ParaView API, VTK
Windowing APIs	GLFW, SDL, Windows SDK

Software (Select)

HID.HPP *C++23*

GITHUB.COM/ACDEMIRALP/HID.HPP *June 2023 - Present*

Single header C++23 wrapper for libusb/hidapi.

FD *C++20, CUDA*

GITHUB.COM/ACDEMIRALP/FD *August 2022 - Present*

Generic finite differences in C++20.

ACD *C++17, CUDA*

GITHUB.COM/ACDEMIRALP/ACD *January 2019 - Present*

Single file utilities for C++17. 30+ stars.

FG *C++17*

GITHUB.COM/ACDEMIRALP/FG *January 2018 - Present*

Rendering abstraction describing a frame as a directed acyclic graph of render tasks and resources. 400+ stars, 50+ forks.

GL *C++17*

GITHUB.COM/ACDEMIRALP/GL *May 2017 - Present*

Header-only C++17 wrapper for OpenGL 4.6 Core Profile. 150+ stars, 10+ forks. Featured in the Khronos Group August 2017 newsletter.

Publications (Select)

A C++20 Interface for MPI 4.0 *Supercomputing 2022*

A.C. Demiralp, P. Martin, N. Sakic, M. Krüger, T. Gerrits *November 2022*

Astray: A Performance-Portable Geodesic Ray Tracer *VMV 2022*

A.C. Demiralp, M. Krüger, C. Chao, T.W. Kuhlen, T. Gerrits *September 2022*

MODE: A Modern Ordinary Differential Equation Solver for C++ and CUDA *ICNAAM 2022*

A.C. Demiralp, M. Krüger, T. Gerrits *September 2022*

Performance Assessment of Diffusive Load Balancing for Dist. Particle Advection *WSCG 2022*

A.C. Demiralp, D.N. Helmrich, J. Protze, T.W. Kuhlen, T. Gerrits *May 2022*

Parallel Particle Advection and Lagrangian Analysis for 3D-PLI FOMs *IEEE LDAV 2019*

A.C. Demiralp, D. Zielasko, M. Axer, T. Vierjahn, T.W. Kuhlen *October 2019*