Tolga Talha Yıldız

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Personal Profile

I am a Computer Graphics researcher, currently a PhD Student at Texas A&M University Computer Science department. I have background in Signal Processing, Geometry Processing and Parallel Programming. Lately I've been working in solid modeling, geometric parametrization, physically based simulations, multi-agent fabrication methods and rendering methods. I am Interested in Computer Graphics, 3D Design, Computational Design, Visual Computing, Computational Geometry.

Education

Texas A&M University   *Texas, USA*

PhD in Computer Science   *Aug 2022 - Current*

- **CGPA:** 3.50/4.00

Bilkent University   *Ankara, Turkey*

BS in Electrical and Electronics Engineering   *Sep 2017 - Jun 2022*

- **CGPA:** 3.46/4.00
- Coordinated Imagination Bridge Project under Social Awareness Projects

Skills

Programming	C/C++, JavaScript, Python, Java, C#, CUDA, HLSL/GLSL, VHDL, System-Verilog/Verilog, x86 Assembly, 8051 Assembly, MATLAB.
Frameworks/APIs	Tensorflow, PyTorch, Darknet, Intel Embree, OpenGL, Vulkan, DirectX, Direct3D, OpenMP.
Softwares	Blender, Cinema 4D, Maya, Unity, Unreal Engine 4, LaTeX, Microsoft Office, Git, VIVADO.
Miscellaneous	Linux, Shell (Bash/Zsh), LaTeX, Microsoft Office, Git.

Work Experience

Texas A&M University   *College Station, Texas*

Teaching Assistant   *Aug 2022 - Present*

- Lab supervision in VIST170 Introduction to Visualization Computing Environments course.
- Project supervision in CSCE646 Digital Image course.
- Lab and assignment supervision in CSCE120/121 Introductory C++ Course
- **Technical Skills:** Python, C++, OpenGL, Javascript, WebGL.

Signalton Technology   *Ankara, Turkey*

Capstone Project Engineer   *Sep 2021 - Jun 2022*

- Developed an IoT device that can do audio identification, image classification/tracking and anomaly detection tasks with embedded neural networks in low energy demand and low memory capacity microcontroller units.
- **Technical Skills:** C++, Darknet, Tensorflow Lite.

Graphics and Imaging Lab   *Zaragoza, Spain*

Research Intern   *Jun 2021 - Oct 2021*

- Developed backprojection algorithms for Non-Line of Sigth Imaging task using phasor fields.
- **Technical Skills:** C++, MATLAB, Blender.

Bilkent University   *Ankara, Turkey*

Research Intern   *Jun 2021 - Oct 2021*

- Implemented Material Point Method solver for granular material types.
- **Technical Skills:** Python, C++, OpenGL.

Bilkent University   *Ankara, Turkey*

Research Intern   *Aug 2020 - Oct 2020*

- Implemented a queue network with stochastic variables to simulate the age of the information in the network, which represent how old the information is.
- **Technical Skills:** Python.

AYDUO Electronics   *Ankara, Turkey*

Digital Design Intern   *Aug 2019 - Sep 2019*

- Constructed a Gbit/s speed network and implemented OSI Model for FPGA-PC interactions
- **Technical Skills:** VHDL, VIVADO.

Projects

Woven Structure Generator and 3D Object Decomposition Software in C++   *College Station, Texas*

Texas A&M University   *Nov 2022 - Nov 2022*

- A novel 3D and 2D woven structure generator that will be used in solid modeling. Resulting weaves can be used in decomposition of any 3D objects.

Tone Mapping Software in C++   *College Station, Texas*

Texas A&M University   *Nov 2022 - Nov 2022*

- A novel tone mapping with new monotonically increasing operator that generates LDR image from HDR image. Uses histogram fitting that protects the features of the image.

Physically Based Simulator in C++   *College Station, Texas*

Texas A&M University   *Aug 2022 - Nov 2022*

- Implemented a simulator that uses different physical based simulation of materials. This include particle based simulations, spring based soft body simulations, rigid body simulations, flocking behaviour. As a final project hair simulator that uses Cosserat Theory has been implemented. For visualization OpenGL and Vulkan APIs have been used.

Vulkan Renderer   *College Station, Texas*

Texas A&M University   *Oct 2022 - Oct 2022*

- Generic Vulkan Renderer that is used for visualizing 3D models.

Cone Beam Computer Tomography Simulator in MATLAB   *Ankara, Turkey*

Bilkent University   *Jan 2022 - Jan 2022*

- Simulation of cone beam tomography in MATLAB using Feldkamp-Davis-Kres reconstruction algorithm from the mononergetic radiation source on the Zubal Phantom and 3D Procedural Shepp-Logan Phantom datasets with different mediums.

Image Captioning Neural Network   *Ankara, Turkey*

Bilkent University   *Dec 2021 - Jan 2022*

- Construction of transformer based attention mechanism to caption a given image using feature vectors from ResNet encoder used on a given dataset of images and caption labels. Used Python with Tensorflow framework.

MPM Solver in Python   *Ankara, Turkey*

Bilkent University   *June 2021 - Oct 2021*

- Implementation of an MPM solver fro simulating continuum materials using taichi library.

Non-Line-of-Sight Imaging Simulator   *Zaragoza, Spain*

Zaragoza University   *June 2021 - Oct 2021*

- Implementation of ray tracer for simulating NLOS setting and backprojection algorithm to reconstruct geometry.

Convex Hull Calculator and Visualizer   *Ankara, Turkey*

Bilkent University   *Mar 2021 - Apr 2021*

- Implementation of gift wrapping algorithm with interactive visualization in Javascript with WebGL API using GLSL shaders.

Monte Carlo Ray Tracer in C++   *Ankara, Turkey*

Bilkent University   *Jan 2021 - Jan 2021*

- Ray tracer implementation in C++ using standard libraries.

Computer Graphics Course Projects   *Ankara, Turkey*

Bilkent University   *Sep 2020 - Jan 2021*

- Browser based HTML/Javascript WebGL projects on both 2D visual recursion algorithms and 3D animation applications character animation. Also implementation of a real time monte-carlo ray tracer.

Achievements

2017-2022	**Scholarship**, Comprehensive Scholarship of Bilkent University	*Turkey*
2022	**Social Awareness and Activities**, Bilkent University Graduation Awards	*Turkey*
2021	**Super-Coordinator**, Bilkent Social Awareness Projects	*Turkey*
2019	**Super-Volunteer**, Bilkent Social Awareness Projects	*Turkey*

References available upon request.