# NIHAT ISIK

## Computer Science


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*Software Engineer with 3 years of C, C++, C# and Python development experience. Strong 3D math skills. Extensive experience in game development, gameplay, game engine, graphics, AI, and physics programming. Team player able to contribute to many areas of software development.*

## EDUCATION

### MS Computer Science

**Computer Vision & Graphics Focus**

Sep 2018 - Mar 2021  ETH Zürich, Switzerland

- Shape Modeling and Geometry Processing (5.75/6.0)
- Physically-Based Simulation in Computer Graphics (5.25/6.0)
- Advanced Systems Lab (5.5/6.0)
- Computer Vision (5.0/6.0)
- Game Programming (2nd place)

### BSc Computer Science

Sep 2015 - Aug 2018  ETH Zürich, Switzerland

- Visual Computing (5.0/6.0)
- Lineare Algebra (5.25/6.0)
- Analysis I & II (5.25/6.0)

## WORK EXPERIENCE

### Software and Research Engineer Internship

**Optimize human pose estimation pipeline**

Oct 2019 - Feb 2020  Disney Research Studios

- Worked on the problem of Human Pose Estimation from single RGB Camera.
- Research ways to reduce outliers in the prediction.
- Implement a skeleton importer in Blender and Maya.
- Implement a Gradient Descent optimizer in order to achieve better results in the final 3D output by taking advantage of the accurate 2D predictions.
- Implement a system to visualise the predictions and virtually augment characters (e.g. add a hat) in Unity.
- *Technologies: C#, Python, PyTorch, Blender, Maya, Unity*

### Software Engineer - Game Developer

**Personal Startup**

Apr 2018 - present  Kneehat Games

- Design and develop games as a solo developer collaborating with artists.
- Developed a game from scratch using Unity Game Engine and published on Google Game Play and App Store (Space Color Bird).
- *Technologies: C#, Unity, Blender, Photoshop, Udacity*

### Master Thesis

**Interpolating Keyframed Poses into Locomotion**

Sep 2020 - March 2021  Disney Research Studios

- Implement a tool for animators to send simple keyframed poses from Maya to Unity. Process information in Unity and create a locomotion animation with the received keyframes. Send locomotion poses back to Maya.
- Implement a Maya GUI application.

## TECHNICAL STRENGTH

| | |
|---|---|
| C# | ●●●●○ |
| C/C++ | ●●●●○ |
| Python, PyTorch | ●●●●○ |
| Java, Eiffel | ●●●○○ |
| HTML, CSS, JS, Bootstrap | ●●●○○ |
| Git, Sourcetree | |
| Unity Game Engine, Blender | |
| Photoshop, Premiere | |

## ACHIEVEMENTS

**Hazmat - Game Programming**
Secured 2nd place in the course over 7 games produced by groups of 3-6.

**Hall of Fame - Physically-Based Simulation**
Secured a place in the *Hall of Fame* section of the course.

**Space Color Bird**
Published a game on App Store and Google Play.

**Augmenting Cats and Dogs: Procedural Texturing for Generalized Pet Tracking**
Published a paper as a co-author at GRAPP - 16th International Conference on CG Theory and Applications during my Internship at Disney Reasearch Studios.

## LANGUAGES

| | |
|---|---|
| German | Native |
| Italian | Native |
| Kurdish | Native |
| English | C1 |
| Turkish | B2 |

- Implement a server-client connection between Unity and Maya to exchange poses back and forth.
- Implement paper *Recurrent transition networks for character locomotion*.
- *Technologies: C#, Python, PyTorch, Unity, Blender, Maya*

### Bachelor Thesis

**UnityRL: a Deep Reinforcement Learning Framework to train Characters in the Unity 3D Environment**

Feb 2018 - Aug 2018 | Computational Robotics Lab

- Tested Unity RL and trained different environments to test the most effective description for the agents in a Reinforcement Learning setting.
- Trained a virtual car to park.
- *Technologies: C#, Python, Unity, ML Agents, Blender*

### Teaching Assistant

**Software Engineer in C++**

Feb 2019 - May 2019 | ETH Zürich, Switzerland

- Teach c++ and OOP concepts to ∼20 students.

### Teaching Assistant

**Introduction to Java**

Sep 2017 - Dec 2017 | ETH Zürich, Switzerland

- Introduce programming concepts using Java to ∼20 students.

## PROJECTS

### Fast CPU RayMarcher

- Advanced Systems Lab course at ETH, semester-long team project of four people.
- Responsible for scalar optimization (codemotion, strength reduction, loop unrolling, etc.).
- Responsible for vectorizing the pipeline using Intel Intrinsics (SIMD).
- Responsible for creating a .json scene parser.
- *Technologies: C, C++*.

### Physically based simulation: rigid and soft body simulation library

- Project for PBS master course at ETH.
- Library that consists of a position based dynamics system with a Verlet integration scheme. All objects are represented by particles and constraints.
- Solving for the constraints is done iteratively in a Gauss-Seidel fashion.
- Lightweight and supports cloth system, dynamic elastic mesh deformation and elastic rig.
- *Technologies: C#, Unity*.

### Build a Game in a Team

- Team of 6 people, 3 artists and 3 programmers, using Scrum workflow.
- Built a game using Monogame, integrating different frameworks and the assets from the artists.
- *Technologies: C#, MonoGame, Blender*.

### Build a Physically-based Path Tracer

- I developed a physically-based renderer implementing Path Tracing, depth of field and other rendering features.
- *Technologies: C++, Nori*.

### Semantic Road Segmentation

- Computational Intelligence Lab course at ETH. Team: four people.
- From 100 labeled satellite images we trained a network to learn to detect roads pixelwise.
- *Technologies: Python, Keras*.

### Personal Project: Space Color Bird

- Indie game studio.
- Published a game on iOS and Android.
- *Technologies: C#, Unity, Blender, Photoshop*.

## EXTRACURRICULAR ACTIVITIES

### Ludicious - Zürich Game Festival

2018, 2020 | Zürich, Switzerland

- Attended the gaming convention twice for personal interest about the game industry.

### Hack Zürich

Sep 2019 | Zürich, Switzerland

- Partecipated in the hackaton, connected with people and learned interesting technologies.

### Computer Science Consultant

Feb 2018, Feb 2019 | TI, Switzerland

- Introduced Computer Science at ETH to high school students.

### Parkour Teacher

Sep 2012 - Sep 2015 | TI, Switzerland

- Hold parkour courses to ∼10-20 students.
- Outside and inside parkour sessions.

### Summer Camp Supervisor

July 2013 - Aug 2013 | TI, Switzerland

- Supervise kids for 1 month of daily summer activities.

## HOBBIES

**Gaming**
I enjoy playing games. This also inspires me to try and replicate some nice effect or mechanic that catches my curiosity.

**Fitness**
I keep care of my body and mind by exercising regularly. I do all types of sports, but usually I train with weights.

**Reading**
I read all types of genres but I mostly prefer self improvement books or books that cover topics that I don't know much about.

## REFERENCES

Available upon request.