

Nikolaos Zioulis

COMPUTER VISION · COMPUTER GRAPHICS · MACHINE LEARNING · XR

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“An engineer and scientist working at the intersection of computer vision, machine learning and computer graphics. He is currently on a path to unify of volumetric capture, AI and body simulation technology. His research interests have set him on the pursuit of data-driven priors, latent optimization, and efficient neural processing and generative AI.”

Positions

Moverse P.C.

CHIEF TECHNOLOGY OFFICER

- Principal Scientist
- Roadmap Development
- Technical Lead
- Intellectual Property

Thessaloniki, Greece

Feb. 2023 - Present

Klothed Technologies Inc.

COMPUTER VISION, GRAPHICS & MACHINE LEARNING ENGINEER

- Monocular body fitting
- Proof-of-concept to public beta release
- Autonomously navigated a fast-paced start-up environment

Remote, U.S.A

Nov. 2021 - Feb 2023

Visual Computing Lab, Information Technologies Institute, Centre for Research and Technology Hellas

R&D ENGINEER

- Research and development using computer vision, computer graphics and machine learning technologies.
- Internal project management in collaborative R&D projects ([Hyper360](#), [5G-Media](#), [ATLANTIS](#), [RESCUER](#))
- Technical work-package leader (3D scene reconstruction, diminished reality) in the ATLANTIS H2020 project.
- Lead the design and development of a low-cost volumetric capture system in the Hyper360 H2020 project.
- Use case leader (adaptive streaming tele-immersion pilot) of the 5G-Media H2020 project
- Technical work-package leader (Visual localization) in the RESCUER H2020 project.
- Lead a small team of research assistants resulting in over 30 publications during a three year period (2017 – 2020).
- Successful and significant participation in the lab's funding acquisition.

Thessaloniki, Greece

Oct. 2013 - Dec. 2021

Education

Universidad Politécnica de Madrid

DATA-DRIVEN MONOCULAR DEPTH ESTIMATION FROM SPHERICAL PANORAMAS (PHD)

Madrid, Spain

Mar. 2019 - Jun 2023

Aristotle University of Thessaloniki

EECS (BSc & MSc)

Thessaloniki, Greece

Sep 2002 - June 2012

Selected Publications

For a complete and up to date list please check my [Google Scholar](#) profile.

Towards Practical Single-shot Motion Synthesis

[\[paper\]](#) [\[project page\]](#)

KONSTANTINOS RODITAKIS, SPYRIDON THERMOS, [NIKOLAOS ZIOULIS](#)

CVPRW

Jun. 2024

BundleMoCap: Efficient, Robust and Smooth Motion Capture from Sparse Multiview

[Videos](#) [\[paper\]](#) [\[project page\]](#)

GEORGIOS ALBANIS, [NIKOLAOS ZIOULIS](#), KOSTAS KOLOMVATOS

CVMP

Nov. 2023

- Noise-in, Bias-out: Balanced and Real-time MoCap Solving**
[\[paper\]](#) [\[project page\]](#) [ICCVW](#)
 GEORGIOS ALBANIS, [NIKOLAOS ZIOULIS](#), SPYRIDON THERMOS, ANARGYROS CHATZITOFIS, KOSTAS KOLOMVATOS Oct. 2023
- KBody: Towards general, robust, and aligned monocular whole-body estimation**
[\[paper\]](#) [\[project page\]](#) [CVPRW](#)
 NIKOLAOS ZIOULIS, JAMES F. O'BRIEN Jun. 2023
- Hybrid Skip: A Biologically Inspired Skip Connection for the UNet Architecture**
[\[paper\]](#) [IEEE Access](#)
 NIKOLAOS ZIOULIS, GEORGIOS ALBANIS, PETROS DRAKOULIS, FEDERICO ALVAREZ, DIMITRIOS ZARPALAS, PETROS DARAS May 2022
- Monocular spherical depth estimation with explicitly connected weak layout cues**
[\[paper\]](#) [ISPRS Journal of Photogrammetry & Remote Sensing](#)
 NIKOLAOS ZIOULIS, FEDERICO ALVAREZ, DIMITRIOS ZARPALAS, PETROS DARAS Jan. 2022
- Zeroth-Order Optimizer Benchmarking for 3D Performance Capture**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [GECCO](#)
 ALEXANDROS DOUMANOGLU, PETROS DRAKOULIS *, KYRIAKI CHRISTAKI *, [NIKOLAOS ZIOULIS *](#), VLADIMIRO
 STERZENTSSENKO, ANTONIS KARAKOTTAS, DIMITRIOS ZARPALAS, PETROS DARAS. Jul. 2021
- Pano3D: A Holistic Benchmark and a Solid Baseline for 360° Depth Estimation.**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [\[data\]](#) [\[demo\]](#) [CVPRW](#)
 GEORGIOS ALBANIS *, [NIKOLAOS ZIOULIS *](#), PETROS DRAKOULIS, VASILEIOS GKITSAS, VLADIMIRO
 STERZENTSSENKO, FEDERICO ALVAREZ, DIMITRIOS ZARPALAS, PETROS DARAS. Jun. 2021
- PanoDR: Spherical Panorama Diminished Reality for Indoor Scenes.**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [CVPRW](#)
 VASILEIOS GKITSAS, VLADIMIRO STERZENTSSENKO, [NIKOLAOS ZIOULIS](#), GEORGIOS ALBANIS, DIMITRIOS ZARPALAS. Jun. 2021
- Single-shot cuboids: Geodesics-based end-to-end Manhattan aligned layout estimation from spherical panoramas.** [\[paper\]](#) [\[project page\]](#) [\[code\]](#) [Image and Vision Computing](#)
[NIKOLAOS ZIOULIS](#), FEDERICO ALVAREZ, DIMITRIOS ZARPALAS, PETROS DARAS. Mar. 2021
- DronePose: Photorealistic UAV-Assistant Dataset Synthesis for 3D Pose Estimation via a Smooth Silhouette Loss.** [\[paper\]](#) [\[project page\]](#) [\[code\]](#) [\[data\]](#) [ECCVW](#)
 GEORGIOS ALBANIS *, [NIKOLAOS ZIOULIS *](#), ANASTASIOS DIMOU, DIMITRIOS ZARPALAS, PETROS DARAS Aug. 2020
- Deep Soft Procrustes for Markerless Volumetric Sensor Alignment.**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [IEEE VR](#)
 VLADIMIRO STERZENTSSENKO, ALEXANDROS DOUMANOGLU, SPYRIDON THERMOS, [NIKOLAOS ZIOULIS](#), DIMITRIOS ZARPALAS,
 PETROS DARAS Mar. 2020
- Deep Lighting Environment Map Estimation from Spherical Panoramas.**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [CVPRW](#)
 VASILEIOS GKITSAS *, [NIKOLAOS ZIOULIS *](#), FEDERICO ALVAREZ, DIMITRIOS ZARPALAS, PETROS DARAS Jun. 2020
- Spherical View Synthesis for Self-Supervised 360 Depth Estimation.**
[\[paper\]](#) [\[project page\]](#) [\[code\]](#) [\[data\]](#) [3DV](#)
[NIKOLAOS ZIOULIS](#), ANTONIS KARAKOTTAS, DIMITRIOS ZARPALAS, FEDERICO ALVAREZ, PETROS DARAS Sep. 2019

Self-supervised Deep Depth Denoising.

[\[paper\]](#) [\[project page\]](#) [\[code\]](#)

VLADIMIRO S TERZENTSENKO *, LEONIDAS SAROGLUO *, ANARGYROS CHATZITOFIS *, SPYRIDON THERMOS *,

NIKOLAOS ZIOULIS *, ALEXANDROS DOUMANOGLUO, DIMITRIOS ZARPALAS, PETROS DARAS

ICCV

Oct. 2019

A Low-cost, Flexible and Portable Volumetric Capturing System.

[\[paper\]](#) [\[project page\]](#) [\[software\]](#)

VLADIMIRO S TERZENTSENKO *, ANTONIS KARAKOTTAS *, ALEXANDROS PAPACHRISTOU *, NIKOLAOS ZIOULIS *, ALEXANDROS

DOUMANOGLUO, DIMITRIOS ZARPALAS, PETROS DARAS

SITIS

Nov. 2018

Fast Deformable Model-based Human Performance Capture and FVV using Consumer-grade RGB-D Sensors. [\[paper\]](#) [\[supplementary\]](#) [\[project page\]](#) [\[data\]](#)

DIMITRIOS S ALEXIADIS, NIKOLAOS ZIOULIS, DIMITRIOS ZARPALAS, PETROS DARAS

Pattern Recognition

Jul. 2018

OmnDepth: Dense Depth Estimation for Indoors Spherical Panoramas.

[\[paper\]](#) [\[project page\]](#)

NIKOLAOS ZIOULIS *, ANTONIS KARAKOTTAS *, DIMITRIOS ZARPALAS, PETROS DARAS

ECCV

Sep. 2018

Improving Camera Pose Estimation via Temporal EWA Surfel Splatting. [\[paper\]](#)

NIKOLAOS ZIOULIS *, ALEXANDROS PAPACHRISTOU *, DIMITRIOS ZARPALAS, PETROS DARAS

ISMAR

Oct. 2017

An integrated platform for live 3D human reconstruction and motion capturing.

[\[paper\]](#) [\[project page\]](#) [\[data\]](#)

DIMITRIOS S ALEXIADIS, ANARGYROS CHATZITOFIS, NIKOLAOS ZIOULIS, OLGA ZOIDI, GEORGIOS LOUIZIS, DIMITRIOS ZARPALAS,

PETROS DARAS

IEEE TCSVT

Apr. 2017

Selected Projects

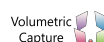
moai: Accelerating modern data-driven workflows

GitHub

LEAD DESIGNER & DEVELOPER, TEAM LEADER

Jan. 2021 - Present

- PyTorch-based AI Model Development Kit (MDK) that aims to improve data-driven model workflows, design and understanding.
- Open-source, Apache 2.0 licensed.
- Presented in [PyTorch Developer's Day 2021](#). [\[poster\]](#)



VolCap: A Portable, Flexible and Facile Volumetric Capture System

GitHub

LEAD DESIGNER & DEVELOPER, TEAM LEADER

Jun. 2018 - Oct. 2020

- Multi-sensor volumetric capturing system.
- Kinect for Azure and Intel RealSense sensors supported (hybrid setups too).
- Structure-based multi-sensor spatial alignment.

Awards

INTERNATIONAL

2020 **2nd Prize**, Open Optimization Competition [\[link\]](#)

Online

2019 **1st Place**, Best Demo Award at the International Conference on Multimedia Modeling [\[link\]](#)

Thessaloniki, GR

Talks

Tutorial on Volumetric Video

Online

EUROGRAPHICS CONFERENCE

May. 2021

- Presented our work on low-cost volumetric video with consumer grade sensors. [\[video\]](#) [\[paper\]](#)

The Atlantis Project

Online

STEREOPSIA CONFERENCE

Dec. 2020

- Presented the technical challenges of the Atlantis H2020 project.

- Presented our developments in the 5G-MEDIA H2020 project at the Training School on Emerging Technologies for 5G and Internet of Things.

Development

Programming	C++11/14/17/20, Python, CUDA, C#, Reactive Extensions
Machine Learning	PyTorch, Caffe, ONNX
Computer Vision	OpenCV, Eigen, g2o, Microsoft Kinect, Intel RealSense, OAK-D
Computer Graphics	OpenGL, GLSL, GLFW, GLEW, Blender, Unity3D, CG, bgfx, ImGui
IDE	Visual Studio, Visual Studio Code
Documentation	LaTeX, MkDocs, Microsoft Office, Excalidraw
Other Tools	Git, Docker, GitHub, MeshLab, RabbitMQ, CloudCompare
Languages	English, Greek

Academic Services

- 2024 **Reviewer**, Asian Conference on Computer Vision (ACCV)
- 2024 **Reviewer**, European Conference on Computer Vision (ECCV)
- 2024 **Reviewer**, IEEE Conference on Computer Vision and Pattern Recognition (IEEE CVPR)
- 2024 **Reviewer**, IEEE Winter Conference of Applications on Computer Vision (IEEE WACV)
- 2023 **Reviewer**, IEEE International Conference on Computer Vision (IEEE ICCV)
- 2023 **Reviewer**, Omnidirectional Computer Vision Workshop (OmniCV @ CVPR)
- 2023 **Reviewer**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IEEE IROS)
- 2023 **Reviewer**, IEEE Conference on Computer Vision and Pattern Recognition (IEEE CVPR)
- 2023 **Reviewer**, IEEE Winter Conference of Applications on Computer Vision (IEEE WACV)
- 2022 **Reviewer**, IEEE Transactions on Visualization and Computer Graphics (IEEE TVCG)
- 2022 **Reviewer**, IEEE Transactions on Circuits and Systems for Video Technology (IEEE TCSVT)
- 2022 **Reviewer**, European Conference on Computer Vision (ECCV)
- 2022 **Reviewer**, Elsevier ISPRS Journal of Photogrammetry and Remote Sensing (PHOTO)
- 2022 **Reviewer**, IEEE 2022 International Symposium on Mixed and Augmented Reality (IEEE ISMAR)
- 2022 **Reviewer**, IEEE Conference on Computer Vision and Pattern Recognition (IEEE CVPR)
- 2022 **Reviewer**, Elsevier Computers & Graphics (CAG)
- 2022 **Reviewer**, IEEE Winter Conference of Applications on Computer Vision (IEEE WACV)
- 2022 **Reviewer**, IEEE Virtual Reality Conference (IEEE VR)
- 2021 **Reviewer**, Elsevier Computers in Industry (COMIND)
- 2021 **Reviewer**, IEEE Virtual Reality Conference (IEEE VR)
- 2021 **Reviewer**, IEEE Winter Conference of Applications on Computer Vision (IEEE WACV)
- 2020 **Reviewer**, IEEE Communications Magazine (IEEE COMMAG)
- 2020 **Reviewer**, IEEE Conference on Computer Vision and Pattern Recognition (IEEE CVPR)
- 2020 **Reviewer**, IEEE International Conference on Multimedia & Expo (IEEE ICME)
- 2019 **Reviewer**, IEEE Trans. Circuits, Systems and Video Technology (IEEE TCSVT)