Dr Melinos Averkiou

Curriculum Vitae

Contact Information

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Research Interests

My research lies in artificial intelligence, specifically at the intersection of machine learning and computer vision, with a focus on discriminative and generative deep neural models for 3D vision. In my view, achieving strong AI is closely linked to making real and virtual worlds indistinguishable. The primary goal of my work is therefore to bridge their gap, to the point where the virtual becomes seamlessly integrated with the real. To achieve this, I develop novel methods aimed at both understanding real-world environments and generating virtual environments across multiple scales, from objects to buildings and entire cities. My work enables AI tools advancing not only engineering, robotics, and extended reality, but also revolutionizing areas like autonomous systems, urban planning, remote sensing, and healthcare.

Education

University College London, London, UK — 10/2011 – 09/2015
Department of Computer Science
PhD in Computer Science
Thesis: Data-driven Modelling of Shape Structure
Advisor: Prof. Niloy Mitra

Stanford University, Palo Alto, USA — 08/2014 – 09/2014
Geometric Computing Group
Visiting PhD student
Advisors: Prof. Leonidas Guibas & Dr Vladimir Kim

University of Cambridge, Cambridge, UK — 10/2009 – 10/2010
Computer Laboratory
MPhil in Advanced Computer Science (GPA: 75/100)
Thesis: 3D Interfaces for 3D Modelling
Advisor: Prof. Neil Dodgson

University of Cyprus, Nicosia, Cyprus — 09/2005 – 06/2009
Department of Computer Science
BSc in Computer Science (GPA: 9.3/10), ***summa cum laude* - top of the class**
Thesis: A multi-touch interface for 3D navigation inside the virtual world of a museum exhibit
Advisor: Prof. Yiorgos Chrysanthou

Professional Experience

CYENS Centre of Excellence, Nicosia, Cyprus — 07/2019 – present
Research Department
Associate Professor (Research)
Group leader of the Visual Computing Group (VCG), working on making real and virtual worlds indistinguishable, contributing to the progression towards strong AI. Results published in top venues including ICCV, 3DV, WACV, SGP. In charge of the organization's AI infrastructure, including Prometheus, the first peta-scale supercomputer in Cyprus dedicated to AI.

MindXs Ltd, Nicosia, Cyprus 03/2021 – present

Co-founder

Director of the R&D effort on artificial intelligence for automating electroencephalogram (EEG) signal processing for diagnostic purposes. In charge of CerebroEEG, the company's automated EEG analysis web platform. Responsible for raising funding, secured €100k pre-seed funding, applied for €500k seed funding.

University of Cyprus, Nicosia, Cyprus 07/2019 – present

Department of Computer Science

Adjunct Research Scientist

Principal investigator for the ANNFASS project (2018–2021), funded by the Cyprus Research & Innovation Foundation with €250k. ANNFASS is the first neural network framework for understanding the structure and style of historical buildings.

Course instructor for Deep Learning (DSC515), Computer Vision (CS447), Computer Vision (Master in AI – MAI644).

University of Cyprus, Nicosia, Cyprus 10/2015 – 06/2019

Department of Computer Science

Research Scientist

Post-doctoral research fellow, working on deep learning for 3D vision, funded by a UCY Post-Doctoral Fellowship with €44k. Results published in CVPR (424 citations to date), the highest impact scientific conference according to Google Scholar.

Course instructor for Visual Computing (CS607), Computer Games Engineering (CS653), Programming Problem Solving Methods (CS032).

Shenzhen Institutes of Advanced Technology, Shenzhen, China 10/2015 & 01/2016

Visual Computing Research Center

Visiting Research Scientist

Post-doctoral visitor, collaborating with local researchers on representation learning for shape analysis. Results published in ACM TOG, the top computer graphics journal (impact factor 6.2).

Grants

- Cyprus Research & Innovation Foundation *Infrastructures* Grant – €75.000 2024 – present
  Co-principal Investigator for CRAFTC Project.
- Horizon Europe *CL2-2021-HERITAGE-01-04* Grant – €600.000 2022 – present
  Co-principal Investigator for PREMIERE Project.
- CYENS Centre of Excellence Internal Research Grant – €50.000 2022 – 2023
  Principal Investigator for DeepRecNet Project.
- Cyprus Research & Innovation Foundation *PRE-SEED* Grant – €100.000 2021 – 2022
  Principal Investigator for MindXs project.
- CYENS Centre of Excellence Starting Grant – €190.000 2019 – 2022
  Principal Investigator for VCG Group.
- Cyprus Research & Innovation Foundation *EXCELLENCE* Grant – €250.000 2018 – 2021
  Principal Investigator for ANNFASS Project.

- NVIDIA GPU Grant – €2.500 & €1.500 — 2017 & 2018
  Principal Investigator

Fellowships & Scholarships

- University of Cyprus Post-Doctoral Fellowship – €44.000 — 2016 – 2018
- University College London Studentship Award (Funded by EPSRC) – £86.000 — 2011 – 2015
- Rabin Ezra Scholarship Trust Bursary – £5.000 — 2014
- Cyprus State Scholarship Foundation PhD Scholarship – €15.000 — 2011 – 2014
- A.G. Leventis Foundation – PhD Scholarship £5.000 — 2011 – 2012
- University of Cambridge Studentship Award (Funded by EPSRC) – £15.500 — 2009 – 2010
- Cyprus State Scholarship Foundation MSc Scholarship – €5.000 — 2009 – 2010
- A.G. Leventis Foundation MSc Scholarship – £5.000 — 2009 – 2010
- Darwin College Cambridge Bursary – £1.000 — 2009

Honors & Awards

- British Computer Society Distinguished Dissertation Competition, nominated — 2016
- Eurographics Award for Best PhD Thesis, nominated – short-listed — 2016
- Eurographics Best Paper Award, 2nd prize — 2014
- Cyprus RIF *Students in Research* Competition, 1st prize – €3.500 — 2010
- Youth Board of Cyprus Postgraduate Award – €1.700 — 2009
- Cyprus RIF *Students in Research* Competition, 2nd prize – €3.400 — 2009
- Highest GPA in Univ. of Cyprus Computer Science Dept. (three awards) – €3.400 — 2009

Teaching Experience

University of Cyprus, Nicosia, Cyprus
Department of Computer Science
Instructor for the following courses:

- MAI644 – Computer Vision (Master in AI) — Fall 2023
- DSC515 – Deep Learning — Fall 2022
- CS447 – Computer Vision — Spring 2021–2022
- CS653 – Computer Games Software Engineering — Spring 2016–2019
- Computer Games Summer School — Summer 2016
- CS607 – Visual Computing — Fall 2015
- CS032 – Programming Problem Solving Methods — Fall 2015

University College London, London, UK
Department of Computer Science
Teaching Assistant for Image Processing (GV12) course — Fall 2012–2013

Supervision

PhD Students

- Yeshwanth Kumar (CUT) 2021 – present
- Yiangos Georgiou (UCY) 2020 – present
- Marios Loizou (UCY) 2018 – present

MSc Students

- Menghang Hao (UCL) 2022
- Yicheng Zhan (UCL) 2022
- Jiamin Wang (UCL) 2021
- Maria Maslioukova (UCY - distinction) 2021
- Kyriakos Zantis (UCY - distinction) 2019
- Sergios Stamatis (UCY - distinction) 2018

BSc Students

- Andreas Mylidonis (UCY) 2021
- Stephanos Kyriakides (UCY) 2018
- Christos Othonos (UCY - distinction) 2017

Interns

- Tejas Anvekar Year-round 2023-2024
- Nima Alizadeh Summer 2022
- Andreas Kouzelis Summer 2021
- Manos Papageorgiou Summer 2020
- Pardis Ghaz Year-round 2020
- Mona Hodaei Year-round 2020
- Elie El Hachem Summer 2019

Professional Activities

Program Committees

- Eurographics - Posters Chair 2024
- CVPR Workshop on Structural and Compositional Learning on 3D Data 2023
- Shape Modeling International 2018–202
- International Symposium on Visual Computing 2018–2022
- Computer Graphics International 2018–2019
- WSCG Conference on Computer Graphics, Visualization and Computer Vision 2017
- IEEE Melecon 2016
- SIGGRAPH Asia Workshop on Creative Shape Modeling and Design 2014

Reviewer in International Journals

ACM Transactions on Graphics, Computer Graphics Forum, IEEE Transactions on Visualization and Computer Graphics, Computers and Graphics, Graphical Models, Computer Graphics and Applications, Journal of Artificial Intelligence Research, Knowledge-Based Systems

Reviewer in International Conferences

CVPR, ICCV, ECCV, SIGGRAPH, SIGGRAPH Asia, Eurographics, Pacific Graphics, Computer Graphics International, Shape Modeling International, International Symposium on Visual Computing

Administration Duties

CYENS Centre of Excellence, Nicosia, Cyprus

- IT Infrastructure Committee – Member 2023–present
- AI Cluster Committee – Chair 2021–present
- Doctoral Training Program Committee – Chair 2020–2022
- Scientific Council – Member 2019–present

Journal Publications

[1] Loizou, M., Garg, S., Petrov, D., **Averkiou, M.**, Kalogerakis, E. 2023. Cross-Shape Attention for Part Segmentation of 3D Point Clouds. *Computer Graphics Forum 42*, 5. (also presented in *SGP 2023*) (project website)

[2] Artopoulos, G., Maslioukova, M.I., Zavou, C., Loizou, M., Deligiorgi, M., **Averkiou, M.** 2022. An Artificial Neural Network Framework for annotating and classifying Architectural Structure and Style of Built Heritage in 3D. *Journal of Cultural Heritage 63*, pp. 135–147 (project website)

[3] Deligiorgi, M., Maslioukova, M.I., **Averkiou, M.**, Andreou, A.C., Selvaraju, P., Kalogerakis, E., Patow, G., Chrysanthou, Y. and Artopoulos, G., 2021. A 3D digitisation workflow for architecture-specific annotation of built heritage. *Journal of Archaeological Science: Reports, 37*, p.102787. (project website)

[4] Loizou, M., **Averkiou, M.**, Kalogerakis, E. 2020. Learning Part Boundaries from 3D Point Clouds. *Computer Graphics Forum 39*, 5, pp. 183—195. (also presented in *SGP 2020* - acceptance rate: 36%) (project website)

[5] Hu, R., Li, W., van Kaick, O., Huang, H., **Averkiou, M.**, Cohen-Or, D., Zhang, H. 2017. Co-Locating Style-Defining Elements on 3D Shapes. *ACM Transactions on Graphics 36*, 3, pp. 33:1–33:15. (also presented in *SIGGRAPH 2017* - acceptance rate: 28%) (project website)

[6] **Averkiou, M.**, Kim, V.G., Mitra, N.J. 2016. Autocorrelation Descriptor for Efficient Co-alignment of 3D Shape Collections. *Computer Graphics Forum 35*, 1, pp. 261–271. (also presented in *Eurographics 2016*) (project website)

[7] Fish, N.*, **Averkiou, M.***, van Kaick, O., Sorkine-Hornung, O., Cohen-Or, D., Mitra, N. J. 2014. Meta-representation of Shape Families. *ACM Transactions on Graphics 33*, 4, pp. 34:1-34:11. *joint first authors. (also presented in *SIGGRAPH 2014* - acceptance rate: 25%) (project website)

[8] **Averkiou, M.**, Kim, V.G., Zheng, Y., Mitra, N.J. 2014. ShapeSynth: Parameterizing Model Collections for Coupled Shape Exploration and Synthesis. *Computer Graphics Forum 33*, 2, pp. 125-134. (also presented in *Eurographics 2014* - acceptance rate: 25%) (project website)

[9] Zheng, Y., Cohen-Or, D., **Averkiou, M.**, Mitra, N.J. 2014. Recurring Part Arrangements in Shape Collections. *Computer Graphics Forum 33*, 2, pp. 115-124. (also presented in *Eurographics*

2014 - acceptance rate: 25% - **Best Paper Award, 2nd prize**) (project website)

Conference Publications

[10] Petrov, D., Goyal, P., Thamizharasan, V., Kim, V., Gadelha, M., **Averkiou, M.**, Chaudhuri, S., Kalogerakis, E. 2024. GEM3D: GEnerative Medial Abstractions for 3D Shape Synthesis. In *Proceedings of SIGGRAPH*. (project website)

[11] Georgiou, Y., Loizou, M., Kelly, T., **Averkiou, M.** 2024. FacadeNet: Conditional Facade Synthesis via Selective Editing. In *Proceedings of Winter Conference on Applications of Computer Vision (WACV)*, pp. 5384–5393. (project website)

[12] Georgiou, Y., **Averkiou, M.**, Kelly, T. Kalogerakis, E. 2021. Projective Urban Texturing. In *Proceedings of International Conference on 3D Vision (3DV)*, pp. 1034–1043. (project website)

[13] Selvaraju, P., Nabail, M., Loizou, M., Maslioukova, M., **Averkiou, M.**, Andreou, A., Chaudhuri, S., Kalogerakis, E. 2021. BuildingNet: Learning to Label 3D Buildings. In *Proceedings of IEEE/CVF International Conference on Computer Vision (ICCV)*, pp. 10377–10387. **Oral Paper (acceptance rate for oral papers: 3%)** (project website)

[14] Lin, H., **Averkiou, M.**, Kalogerakis, E., Kovacs, B., Ranade, S., Kim, V. G., Chaudhuri, S., Bala, K. 2018. Learning Material-Aware Local Descriptors for 3D Shapes. In *Proceedings of International Conference on 3D Vision (3DV)*, pp. 150–159.

[15] Kalogerakis, E., **Averkiou, M.**, Maji, S., Chaudhuri, S. 2017. 3D Shape Segmentation with Projective Convolutional Networks. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 3779–3788. **Oral Paper (acceptance rate for oral papers: 2.65%)** (project website)

[16] Zheng, S., Prisacariu, V. A., **Averkiou, M.**, Cheng, M. M., Mitra, N. J., Shotton, J., Torr, P.H.S., Rother, C. 2015. Object Proposals Estimation in Depth Image Using Compact 3D Shape Manifolds. In *Lecture Notes in Computer Science, vol 9358 – Proceedings of German Conference on Pattern Recognition (GCPR)*, pp. 196–208. (project website)

[17] **Averkiou, M.**, Mitra, N.J. 2012. Automatic Alignment of Shape Collections. In *Proceedings of Eurographics 2012 - Posters Track*.

[18] **Averkiou, M.**, Dodgson, N. 2011. Comparison of relative (mouse-like) and absolute (tablet-like) interaction with a large stereoscopic work-space. In *Proceedings of the Stereoscopics Displays and Applications XXII Conference*.

[19] **Averkiou, M.**, Chrysanthou, Y. 2009. Evaluating a multi-touch interface for 3D navigation inside the virtual world of a museum exhibit. In *Proceedings of the 10th VAST International Symposium on Virtual Reality, Archaeology and Cultural Heritage*.

[20] Kunkel, T., **Averkiou, M.**, Chrysanthou, Y. 2008. A web-based virtual museum application. In *Proceedings of the 14th International Conference on Virtual Systems and Multimedia*.

Working Papers & Preprints

[21] Adimoolam, Y. K., Chatterjee, B., Poullis, C., **Averkiou, M.** 2024. Pix2Poly: A Sequence Prediction Method for End-to-end Polygonal Building Footprint Extraction. (under review).

[22] Adimoolam, Y. K., Chatterjee, B., Poullis, C., **Averkiou, M.** 2023. Efficient Deduplication and Leakage Detection in Large Scale Image Datasets with a focus on the CrowdAI Mapping Challenge Dataset. *arXiv preprint arXiv:2304.02296* (under review).

Theses & Technical Reports

[23] **Averkiou, M.** 2015. Data-driven Modelling of Shape Structure. *University College London*

[24] **Averkiou, M.** 2010. 3D Interfaces for 3D Modelling. *University of Cambridge*

[25] **Averkiou, M.** 2010. Digital Watermarking. *University of Cambridge*

[26] **Averkiou, M.** 2009. A multi-touch interface for 3D navigation inside the virtual world of a museum exhibit. *University of Cyprus*