

Iason Oikonomidis

Contact

Information

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Current

Employment

[Institute of Computer Science, FORTH](#)

Post-doctoral researcher

January 2015 - present

Research Interests

Machine Learning Theory and Applications

Deep Learning

Deep Learning for Computer Vision

Artificial Neural Networks

Computer Vision

Optimization Algorithms and Applications

Articulated Objects Pose Estimation

Computer Graphics for Computer Vision

Awards and Fellowships

First Prize in [ChaLearn Demonstration Competition](#), sponsored by Microsoft Research, in conjunction with ICPR 2012, Tsukuba, Japan

University of Crete “Maria Michail Manasaki” 2011 - 2012 Bequest Fellow

[PrimeSense](#) (pioneering company in consumer depth sensors) funded my presence in [CVPR'13](#) to [demo](#) our hand tracking software

Internship at Microsoft Research in Cambridge, under the supervision of [Shahram Izadi](#), March 2012 - May 2012

Education

[University of Crete](#), Heraklion, Crete, Greece

Ph.D., [Computer Science Department](#)

January 2015

- Thesis Title: Efficient Tracking of the 3D Articulated Motion of Human Hands
- Supervisor: [Professor Antonis A. Argyros](#)
- Area of Study: Hand Tracking, Human Body Pose Estimation, Articulated Tracking, Computational Vision
- *Magna cum Laude*, with Honors

M.Sc., [Computer Science Department](#) **April 2009**

- Thesis Title: Shape Matching based on Shape Contexts and Dynamic Programming
- Supervisor: [Professor Antonis A. Argyros](#)
- Area of Study: Pattern Recognition, Computational Vision
- *Magna cum Laude*, with Honors

B.A., [Computer Science Department](#), **October 2006**

- Specialization: Computer Vision
- Thesis Title: Background Modeling for Illumination Invariant Change Detection
- Supervisor: [Professor Antonis A. Argyros](#)
- Graduation Degree: 7.7 / 10

B.A., [Mathematics Department](#), **July 2004**

- Specialization: Applied Mathematics
- Graduation Degree: 7.4 / 10

Research Experience

Contribution to several EU-funded and nationally funded research projects:

SignGuide (ELIDEK)	January 2021 - Present
HealthSign (ELIDEK)	July 2018 - December 2020
Co4Robots (EU)	January 2017 - December 2019
WEARHAP (EU)	March 2013 - August 2017
Robohow.Cog (EU)	February 2012 - July 2016
GRASP (EU)	March 2008 - February 2012

Achievements

List of selected academic highlights:

More than **3000 citations** to works I have (co-)authored, more than 2000 since 2015, more than 1900 citations to works where I am first author, **h-index: 12**.

First author of the [internationally most cited paper](#) on hand pose estimation and tracking **More than 1100 citations**

[The earliest practical work](#) on hand-object interaction received oral presentation at IEEE ICCV 2011 **Oral acceptance rate < 3.5%**

[First Prize](#) in the ChaLearn Demonstration Competition, ICPR, 2012 **Sponsored by Microsoft Research**

US patent holder, result of my internship at Microsoft Research, Cambridge in 2012 **Granted in 2014**

University of Crete “Maria Michail Manasaki” 2011 - 2012 Bequest Fellow **Awarded yearly, 2 fellowships awarded to CSD PhD candidates**

Release of the 3D single hand tracking [software](#) **More than 35,000 downloads**

Strong interest [for videos related](#) to my research on hand tracking **More than 100,000 views**

Teaching Experience

List of courses I have taught

Post-graduate course on Computer Vision **Fall semester, 2019-2020**

[Hellenic Mediterranean University](#)

Course title: Advanced Computer Vision Topics

Post-graduate program: [Advanced Production, Automation, and Robotics Systems](#)

Post-graduate course on Computer Vision **Fall semester, 2020-2021**

[Hellenic Mediterranean University](#)

Course title: Advanced Computer Vision Topics

Post-graduate program: [Advanced Production, Automation, and Robotics Systems](#)

Invited Talks

1. “Efficient Tracking of the 3D Articulated Motion of Human Hands”, Max Planck Institute for Intelligent Systems, Tübingen, 27th November, 2014
2. “Hand Pose Estimation - Recent Advances and Current Trends”, University of Exeter, Exeter, 11th January, 2019

Organization of Scientific Events

[HANDS 2019 ICCV workshop](#) co-organizer

Held in conjunction with IEEE ICCV 2019

Date: 28th October, 2019

Location: Seoul

[HANDS 2018 ECCV workshop](#) co-organizer

Held in conjunction with ECCV 2018

Date: 9th September, 2018

Location: Munich

[HANDS 2017 ICCV workshop](#) co-organizer

Held in conjunction with IEEE ICCV 2017

Date: 23rd October, 2017

Location: Venice

Peer Reviewing Reviewer for several top conferences and journals. Selected list:

Conferences

IEEE Computer Vision and Pattern Recognition (CVPR)

IEEE International Conference on Computer Vision (ICCV)

European Conference on Computer Vision (ECCV)

Conference on Neural Information Processing Systems (NeurIPS)

ACM SIGGRAPH

ACM SIGGRAPH Asia

EUROGRAPHICS

ACM Computer-Human Interaction (CHI)

IEEE IROS

IEEE ICRA

Journals

IEEE Transactions on Pattern Analysis and Machine Intelligence

IEEE Transactions on Image Processing

Elsevier Computer Vision and Image Understanding

Elsevier Image and Vision Computing

**Student
co-supervision**

List of students I have co-supervised

Vassilis C. Nicodemou

Ph.D. candidate, expected graduation date: 2022
Computer Science Department, University of Crete
Research topic: “Probabilistic Neural Network Formulation and Applications”
Supervisor: Antonis A. Argyros

Dennis Bautembach

Ph.D. candidate, expected graduation date: Autumn 2021
Computer Science Department, University of Crete
Research topic: “Spiking Neural Network Simulation in Parallel Architectures”
Supervisor: Antonis A. Argyros

Georgios Lydakakis

M.Sc. candidate, expected graduation date: July 2021
Computer Science Department, University of Crete
Thesis title: “Exploitation of noisy automatic data annotation for CNN training
and its application to hand posture classification”
Supervisor: Antonis A. Argyros

Giorgos Karvounas

M.Sc. Thesis, Computer Science Department, University of Crete, February 2019
Thesis title: “PerLNet: Learning to Localize Multiple Periodic Activities in Real-
World Videos”
Supervisor: Antonis A. Argyros

Vassilis C. Nicodemou

M.Sc. Thesis, Computer Science Department, University of Crete, February 2018
Thesis title: “Single shot 3D hand pose estimation using radial basis function
networks trained on synthetic data”
Supervisor: Antonis A. Argyros

Petros Douvantzis

M.Sc. Thesis, Computer Science Department, University of Crete, February 2013
Thesis title: “Dimensionality reduction for efficient hand tracking, pose estima-
tion and classification”
Supervisor: Antonis A. Argyros

Languages

Greek : native tongue
English : fluent

Patents

David Kim, Shahram Izadi, Otmar Hilliges, David Alexander Butler, Stephen Hodges,
Patrick Luke Olivier, Jiawen Chen, Iason Oikonomidis: “Wearable sensor for tracking
articulated body-parts”, publication number: [US 2014/0098018 A1](#), Apr. 10, 2014.

Publications

Refereed Journal Articles

Vassilis C. Nicodemou, **Iason Oikonomidis**, Antonis A. Argyros: “Single-shot 3D
Hand Pose Estimation using Radial Basis Function Networks Trained on Synthetic
Data”, in Pattern Analysis and Applications, Springer, vol. 23, no. 1, pp. 415-428,
2020.

Dennis Bautembach, **Iason Oikonomidis**, Antonis A. Argyros: “Filling the Joints: Completion and Recovery of Incomplete 3D Human Poses”, in *Technologies*, MDPI, vol. 6, no. 4, October 2018.

Damien Michel, **Iason Oikonomidis**, Antonis A. Argyros: “Scale Invariant and Deformation Tolerant Partial Shape Matching”, in *Image and Vision Computing*, Elsevier B.V., volume 29, pp. 459-469, 2011.

Refereed Conference Papers

Dennis Bautembach, **Iason Oikonomidis**, Nikolaos Kyriazis, Antonis A. Argyros, “Multi-GPU SNN Simulation with Static Load Balancing”, In *IEEE International Joint Conference of Neural Networks (IJCNN 2021)*, also available at CoRR, arXiv, July 2021.

Sergiu Oprea, Giorgos Karvounas, Pablo Martinez-Gonzalez, Nikolaos Kyriazis, Sergio Orts-Escolano, **Iason Oikonomidis**, Alberto Garcia-Garcia, Aggeliki Tsoli, Jose Garcia-Rodriguez, Antonis Argyros, “H-GAN: the Power of GANs in your Hands”, In *IEEE International Joint Conference of Neural Networks (IJCNN 2021)*, also available at CoRR, arXiv, July 2021

Dennis Bautembach, **Iason Oikonomidis**, Nikolaos Kyriazis, Antonis A. Argyros, “Faster and Simpler SNN Simulation with Work Queues”, In *IEEE International Joint Conference of Neural Networks (IJCNN 2020)*, also available at CoRR, arXiv, July 2020.

Vassilis Nicodemou, **Iason Oikonomidis**, G. Tzimiropoulos, Antonis A. Argyros, “Learning to Infer the Depth Map of a Hand from its Color Image”, In *IEEE International Joint Conference of Neural Networks (IJCNN 2020)*, Special session on Machine Learning and Deep Learning Methods applied to Vision and Robotics (MLDLMVR), also available at CoRR, arXiv, July 2020.

D. Kosmopoulos, **Iason Oikonomidis**, C. Constantinopoulos, N. Arvanitis, K. Antzakas, A. Bifis, G. Lydakis, A. Roussos, Antonis A. Argyros, “Towards a Visual Sign Language Dataset for Home Care Services”, in *IEEE International Conference on Automatic Face and Gesture Recognition (FG’2020)*, IEEE, pp. 622-626, Buenos Ayres, Argentina, May 2020.

G. Karvounas, **Iason Oikonomidis**, Antonis A. Argyros, “ReActNet: Temporal Localization of Repetitive Activities in Real-World Videos”, in *IEEE International Conference on Computer Vision Workshops (ISV 2019 - ICCVW 2019)*, also available at CoRR, arXiv, IEEE, Seoul, S. Korea, October 2019.

C. Constantinopoulos, D. Kosmopoulos, Antonis A. Argyros, **Iason Oikonomidis**, V. Lampropoulou, K. Antzakas, C. Panagopoulos, A. Menychtas, C. Theoharatos, “The HealthSign Project, Current State and Future Activities”, in *IEEE International Conference on Information, Intelligence, Systems and Applications (IISA 2019)*, IEEE, Patras, Greece, July 2019.

Filippos Gouidis, Paschalis Panteleris, **Iason Oikonomidis**, Antonis A. Argyros: “Accurate Hand Keypoint Localization on Mobile Devices”, in *Machine Vision Applications (MVA 19)*. Also available at [arxiv](#), Tokyo, Japan, May 2019.

Shanxin Yuan, Guillermo Garcia-Hernando, Bjorn Stenger, Gyeongsik Moon, Ju Yong Chang, Kyoung Mu Lee, Pavlo Molchanov, Jan Kautz, Sina Honari, Lihao Ge, Junsong Yuan, Xinghao Chen, Guijin Wang, Fan Yang, Kai Akiyama, Yang Wu, Qingfu Wan, Meysam Madadi, Sergio Escalera, Shile Li, Dongheui Lee, **Iason Oikonomidis**, Antonis A. Argyros, Tae-Kyun Kim: “3D Hand Pose Estimation:

From Current Achievements to Future Goals”, IEEE Conference on Computer Vision and Pattern Recognition 2018. Also available at [arxiv](#), 2018.

Dennis Bautembach, **Iason Oikonomidis**, Antonis A. Argyros: “A Comparative Study of Matrix Completion and Recovery Techniques for Human Pose Estimation”, in International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2018), ACM, pp. 23-30, Corfu, Greece, June 2018.

Paschalis Panteleris, **Iason Oikonomidis**, Antonis A. Argyros: “Using a Single RGB Frame for Real Time 3D Hand Pose Estimation in the Wild”, in IEEE Winter Conference on Applications of Computer Vision (WACV 2018). Also available at [arxiv](#), 2018.

Simone Ciotti, Edoardo Battaglia, **Iason Oikonomidis**, Alexandros Makris, Aggeliki Tsoli, Antonio Bicchi, Antonis A. Argyros, Matteo Bianchi: “Synergy-Driven Performance Enhancement of Vision-Based 3D Hand Pose Reconstruction”, in International Conference on Wireless Mobile Communication and Healthcare, pp. 328-336. Springer, Cham, 2016.

Karvounas, Giorgos, **Iason Oikonomidis**, Antonis A. Argyros: “Localizing Periodicity in Time Series and Videos”, in British Machine Vision Conference, 2016.

Nikolaos Kyriazis, **Iason Oikonomidis**, Paschalis Panteleris, Damien Michel, Ammar Qammaz, Alexandros Makris, Konstantinos Tzevanidis, Petros Douvantzis, Konstantinos Roditakis, Antonis A. Argyros: “A Generative Approach to Tracking Hands and their Interaction with Objects”, in Man-Machine Interactions 4, pp. 19-28. Springer, Cham, 2016.

Iason Oikonomidis, Manolis I.A. Lourakis, Antonis A. Argyros: “Evolutionary Quasi-random Search for Hand Articulations Tracking”, in Computer Vision and Pattern Recognition, 2014.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Tracking the Articulated Motion of Human Hands in 3D”, in ERCIM News, no. 95, 2013.

Markos Sigalas, Maria Pateraki, **Iason Oikonomidis**, Panos Trahanias: “Robust Model-based 3D Torso Pose Estimation in RGB-D Sequences”, in Proceedings of the IEEE International Conference on Computer Vision Workshops, pp. 315-322. 2013.

Petros Douvantzis, **Iason Oikonomidis**, Nikolaos Kyriazis, Antonis A. Argyros: “Dimensionality Reduction for Efficient Single Frame Hand Pose Estimation”, in Computer Vision Systems, 2013.

Dan Song, Nikolaos Kyriazis, **Iason Oikonomidis**, Chavdar Papazov, Antonis A. Argyros, Darius Burschka, Danica Kragic: “Predicting Human Intention in Visual Observations of Hand/Object Interactions”, in Robotics and Automation (ICRA), 2013 IEEE International Conference on, pp. 1608-1615. IEEE, 2013.

Iason Oikonomidis, Nikolaos Kyriazis, Konstantinos Tzevanidis, Antonis A. Argyros: “Tracking Hand Articulations: Relying on 3D Visual Hulls versus Relying on Multiple 2D Cues”, in Symposium on Ubiquitous Virtual Reality, 2013.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Tracking the Articulated Motion of Two Strongly Interacting Hands”, in Computer Vision and Pattern Recognition, 2012.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Efficient Model-based Tracking of the Articulated Motion of Hands”, in International Conference on Cognitive Systems (COGSYS 2012), Vienna, Austria, February 2012.

David Kim, Otmar Hilliges, Shahram Izadi, Alex D. Butler, Jiawen Chen, **Iason Oikonomidis**, Patrick Oliver: “Digits: Freehand 3D Interactions Anywhere using a Wrist-worn Gloveless Sensor” in symposium on User interface software and technology, 2012.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Full DOF Tracking of a Hand Interacting with an Object by Modeling Occlusions and Physical Constraints”, in International Conference on Computer Vision, 2011. **Oral presentation**

Nikolaos Kyriazis, **Iason Oikonomidis**, Antonis A. Argyros: “Binding Vision to Physics Based Simulation: the Case Study of a Bouncing Ball”, in British Machine Vision Conference, 2011.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Efficient Model-based 3D Tracking of Hand Articulations using Kinect”, in British Machine Vision Conference, 2011.

Iason Oikonomidis, Nikolaos Kyriazis, Antonis A. Argyros: “Markerless and Efficient 26-DOF Hand Pose Recovery”, in Asian Conference on Computer Vision, 2010.

Iason Oikonomidis, Antonis A. Argyros: “Deformable 2D Shape Matching based on Shape Contexts and Dynamic Programming”, in International Symposium on Visual Computing, 2009.