

# Siavash Bigdeli

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## Education

- 2014–2018 **Ph.D. in Computer Science**, *University of Bern*, Bern.  
summa cum laude
- 2012–2014 **M.Sc. in Computer Science**, *University of Neuchâtel*, Neuchâtel.  
Specialization in advanced information processing
- 2008–2011 **B.Eng. in Software Engineering**, *Azad University*, Tehran.
- 2006–2008 **A.Eng. in Software Engineering**, *University of Applied Science and Technology*, Tehran.

## Work Experience

- 2019–present **Data Science Researcher**, *Swiss Center for Electronics and Microtechnology SA*, Neuchâtel.
- 2018–2019 **Postdoctoral Researcher**, *École Polytechnique Fédérale de Lausanne*, Lausanne.
- 2014–2018 **Teaching Assistant**, *University of Bern*, Bern.
- 2012–2014 **R&D Engineer**, *3D Impact Media AG*, Bern.

## Honors and Awards

- 2019 **Top 10% paper**, *IEEE International Conference on Image Processing (ICIP)*.
- 2018 **Best Student Paper Award**, *International Conference on Computer Vision Theory and Applications (VISAPP)*.
- 2014 **Best Master Thesis Award**, *Joint Alumni Association in Computer Science (JAACS)*.

## Grants and Acquisitions

- 2021 **Industrial Project**, *Deep learning to optimize nano-structure glasses for AR*. CHF97'000; Co-PI
- 2021 **Marie-Curie PhD Fund**, *Machine learning for 3D scans of newborn piglets*. CHF6'000; Co-PI
- 2020 **UC-MORE Research Fund**, *Multi-spectral imaging with deep neural networks*. CHF494'000; Co-PI
- 2019 **Industrial Project**, *Recurrent neural nets for embedded temperature classification*. CHF91'400; PI

## Thesis

### Doctoral Thesis.

Title Advanced Restoration Techniques for Images and Disparity Maps  
Supervisor Matthias Zwicker, University of Bern and University of Maryland  
summa cum laude

### Master Thesis.

Title Hand-Held 3D Light Field Photography and Applications  
Supervisor Philippe Robert, 3D Impact Media AG, and Matthias Zwicker, University of Bern  
Award Best Master Thesis Award (JAACS)

### Bachelor Thesis.

Title Obstacle Removal Methods from Stereo Images  
Supervisor Alireza Bagheri, Azad University and Amir Kabir University of Technology

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## Publications

### Journals

- 3 **Faceshop: Deep Sketch-based Face Image Editing**, *Tiziano Portenier, Qiyang Hu, Attila Szabo, Siavash A Bigdeli, Paolo Favaro, Matthias Zwicker*, 2018, ACM Transactions on Graphics (SIGGRAPH).
- 2 **Temporally Coherent Disparity Maps using CRFs with Fast 4D Filtering**, *Siavash A Bigdeli, Gregor Budweiser, and Matthias Zwicker*, 2016, IPSJ Transactions on Computer Vision and Applications, 8(1):1–14.
- 1 **Hand-held 3D Light Field Photography and Applications**, *Daniel Donatsch, Siavash A Bigdeli, Philippe Robert, and Matthias Zwicker*, 2014, The Visual Computer, 30(6-8):897–907.

### Conferences

- 8 **GramGAN: Deep 3D Texture Synthesis from 2D Exemplars**, *Tiziano Portenier, Siavash A Bigdeli, and Orçun Göksele*, 2020, Advances in Neural Information Processing Systems (Neurips).
- 7 **AIM 2020 Challenge on Image Extreme Inpainting**, *Evangelos Ntavelis, Andrés Romero, Siavash Bigdeli, Radu Timofte, and others*, 2020, European Conference on Computer Vision Workshops (ECCV).
- 6 **Efficient Neural Vision Systems Based on Convolutional Image Acquisition**, *Pedram Pad, Simon Narduzzi, Clement Kundig, Engin Turetken, Siavash A Bigdeli, and L Andrea Dunbar*, 2020, IEEE Conference on Computer Vision and Pattern Recognition (CVPR, oral).
- 5 **Efficient Blind-Spot Neural Network Architecture for Image Denoising**, *David Honzátko, Siavash A Bigdeli, Engin Türetken, and L Andrea Dunbar*, 2020, Swiss Conference on Data Science (SDS).
- 4 **Image Restoration using Plug-and-Play CNN MAP Denoisers**, *Siavash A Bigdeli, David Honzátko, Sabine Süssstrunk, and L Andrea Dunbar*, 2019, International Conference on Computer Vision Theory and Applications (VISAPP, oral).

- 3 **Deep Semantic Segmentation using NIR as Extra Physical Information**, Siavash A Bigdeli, David Honzátko, Sabine Süsstrunk, and L Andrea Dunbar, 2019, IEEE International Conference on Image Processing (ICIP, oral).
- 2 **Deep Mean-Shift Priors for Image Restoration**, Siavash A Bigdeli, Meiguang Jin, Paolo Favaro, and Matthias Zwicker, 2018, International Advances in Neural Information Processing Systems (NIPS, spotlight).
- 1 **Image Restoration using Autoencoding Priors**, Siavash A Bigdeli and Matthias Zwicker, 2018, International Conference on Computer Vision Theory and Applications (VISAPP, oral).

#### Workshops

- 1 **Image denoising via MAP estimation using deep neural networks**, Siavash A Bigdeli and Sabine Süsstrunk, 2019, International Biomedical and Astronomical Signal Processing (BASP) Frontiers Workshop.

#### Preprints

- 2 **Learning Generative Models using Denoising Density Estimators**, Siavash A Bigdeli, Geng Lin, Tiziano Portenier, L Andrea Dunbar, and Matthias Zwicker, 2020, arXiv:2001.02728.
- 1 **Detecting Memorization in ReLU Networks**, Edo Collins, Siavash A Bigdeli, and Sabine Süsstrunk, 2018, arXiv:1810.03372.

#### Invited Talks

- 2020 **Denoising Density Estimators and Applications**, University of Bern.
- 2019 **Deep Density Approximation for Bayesian Image Restoration**, Zurich University of Applied Sciences/ZHAW.
- 2019 **Un-Supervised Image Restoration**, CSEM, AIBeer workshop.
- 2019 **Unsupervised Learning to Overcome the Data Labeling Challenges for Industrial Vision Applications**, Swiss Data Alliance, MLClinic.
- 2019 **Image Denoising via MAP Estimation Using Deep Neural Networks**, International Biomedical and Astronomical Signal Processing (BASP).
- 2018 **Learning to Mean-Shift in  $O(1)$  for Bayesian Image Restoration**, EPFL, Visual Computing Seminar.
- 2018 **Learning to Mean-Shift in  $O(1)$  for Bayesian Image Restoration**, Computational and Methodological Statistics (CMStatistics).
- 2018 **Learning to Mean-Shift in  $O(1)$  for Bayesian Image Restoration**, SIAM Conference on Imaging Science.

#### Teaching

- Lecturer **Babysitting Neural Nets**, 2020-, CSEM, Deep learning onboarding course.
- Co-lecturer **Computational Photography**, 2018, EPFL, CS Master's course.
- TA **Computational Photography**, 2014/16, University of Bern, CS Master's course.
- Co-supervisor **PhD thesis**, 2020-, Simon Narduzzi, Ultra-low-power neural networks.

- Co-supervisor **Master's thesis**, 2020, Samuel Collins, 3D CNNs for remote vital signs monitoring.
- Co-supervisor **Bachelor's thesis**, 2017, Adrian Wälchli, Optimization of light-field display layers.
- Mentor **PhD thesis**, 2021, Roberta Ruggeri, CNN training for animal health prediction.
- Mentor **PhD thesis**, 2019-, David Honzátka, Deep unsupervised photometric-stereo.
- Mentor **Master's thesis**, 2019, Simon Narduzzi, Optimization of low-power CNNs for face detection.

## Outreach

- Co-PI **EU COST Action (submitted)**, 2020-, delegating AI in precision agriculture, Pushing the boundaries of Animal Monitoring for Precision Livestock Farming.
- Mentor **Scilicon Kids**, 2020-, an outreach program to introduce computer science to young enthusiasts in Neuchâtel.
- Partner **Data Program**, 2019-, several engagements with local SMEs and RTOs in AI platforms for human and livestock monitoring.
- Mentor **Business games**, 2019, Neuchâtel university course on entrepreneurship. Winner team secured 5kCHF funding to use our technology in their startup..
- Mentor **Largo Films**, 2018-, a startup active in AI for movie industry.
- Mentor **Abakino**, 2018-, a startup working on interactive AI for education.

## Academic Services

- PC member **NTIRE: New Trends in Image Restoration and Enhancement workshop and challenges**, *CVPR 2021*, [Url](#).
- Topic editor **Electronics journal**, *MDPI*, [Url](#).
- Co-organizer **Rio Data Challenge: Anomaly Detection & Predictive Maintenance**, *phme 2021*, [Url](#).
- Co-organizer **AIM: Advances in Image Manipulation workshop and challenges**, *ECCV 2020*, [Url](#).
- Session chair **VISAPP**, 2018, [Url](#).
- Reviewer **Neurips**, **ICML**, **PAMI**, **CVPR**, **ECCV**, **MEDIA**, **MDPI**, **JSTSP**.