Martin Danelljan

Probsteistrasse 135
8051 Zürich
Switzerland
☎ *+41 76-381 63 64*
✉ *martin.danelljan@gmail.com*

Scholar Citations: **10000**, H-index: **24**
scholar.google.com/citations?user=NCSSpMkAAAAJ

GitHub Followers: **500**, ☆ **1900**
github.com/martin-danelljan , github.com/visionml

Homepage martin-danelljan.github.io

Twitter twitter.com/MDanelljan

LinkedIn linkedin.com/in/martin-danelljan

Education and Degrees

2014 – 2018 **Doctor of Philosophy in Computer Vision**, *Computer Vision Laboratory, Linköping University*.
- PhD studies with Prof. Michael Felsberg and Dr. Fahad Shahbaz Khan as my advisors.
- On the 11th of June 2018 I defended my thesis titled *Learning Convolution Operators for Visual Tracking*.
- I received the biennial **Best Nordic Thesis Prize** for the period 2017-2018 at SCIA 2019.
- My main research interests were machine learning, deep learning and statistical models for computer vision applications, including visual object tracking, segmentation and registration of 3D-data.
- As a part of my PhD studies, I have taken 90 ECTS credits of graduate courses within the areas of computer vision, machine learning, statistics, and mathematics.

2008 – 2013 **Master of Science in Electrical Engineering**, *Linköping University*, average grade *5.0/5*.
- A five year program in Applied Physics and Electrical Engineering.
- The first three years gave me a strong foundation in mathematics, physics, programming, electronics and systems engineering.
- In the final two years, I focused on signal and image processing, with in-depth courses in signal theory, computer vision, sensor fusion, machine learning, multi-core/GPU programming and mathematics.
- My master's thesis titled *Visual Tracking* was awarded **best thesis** by the Swedish computer society. The work was also published and presented at the premier conference on Computer Vision and Pattern Recognition (CVPR) 2014 as an oral presentation.

Academic Positions

Jan. 2019 – present **Postdoctoral Researcher**, *Computer Vision Laboratory, ETH Zürich*.
Under Prof. Luc Van Gool and Dr. Radu Timofte. The position includes supervision of several PhD and Master students.

Mar. 2014 – Dec. 2018 **PhD Student**, *Computer Vision Laboratory, Linköping University*.
Research in the fields of computer vision and machine learning. The position included studying related graduate courses ($\sim 20\%$) and teaching ($\sim 20\%$).

Aug. 2013 – Mar. 2014 **Research Engineer and TA**, *Computer Vision Laboratory, Linköping University*.
Continued research related to my master's thesis was combined with development of the computer vision component in the *Collaborative Unmanned Aircraft Systems* project.

2012 **Summer Intern**, *Computer Vision Laboratory, Linköping University*.
Implementation and further development of a state-of-the-art video stabilization method.

2012 **Teaching Assistant**, *Department of Electrical Engineering, Linköping University*.
Teaching assistant in a control theory course.

2009 **Teaching Assistant**, *Department of Mathematics, Linköping University*.
Teaching assistant in a calculus course.

Entrepreneurial Experience

Oct. 2017 – present **Cofounder and owner**, *Singulareye*.
The company provides consultancy and commercializes research within computer vision and machine learning. Major projects include:
- Oct. 2017 – Dec. 2018: End-to-end design and development of a deep learning based computer vision system for automotive applications. Customer: *NIRA Dynamics* (Linköping).
- Nov. 2017 – Dec. 2018: Development of a computer vision solution for a smartphone AR application. In particular, we deployed the visual tracking algorithms I developed during my PhD studies. Customer: *Just Football* (Stockholm-based startup).

Awards

2020 Among top 12 reviewers for the *European Conference on Computer Vision* (ECCV).
2019 **Best Nordic Thesis Prize** for the period 2017-2018, awarded at SCIA 2019.
2019 Best student paper award at the *British Machine Vision Conference* (BMVC).
2016 Best paper award at the *International Conference on Pattern Recognition* (ICPR).
2016 Top rank in the *Visual Object Tracking (VOT) Challenge* 2016 at the ECCV 2016 VOT workshop.
2015 Top rank in the *VOT Thermal Infrared Challenge* 2015 at the ICCV 2015 VOT workshop.
2015 Winner of the *OpenCV State-of-the-Art Vision Challenge in Tracking*.
2014 Winner of the *Visual Object Tracking (VOT) Challenge* 2014.
2014 The *Swedish Computer Society award* for **best master's thesis**.
2014 The *Tryggve Holm* medal for outstanding student achievements and grades.

Organized Workshops and Tutorials

2020 **AIM 2020: Advances in Image Manipulation**, *Co-organizer*,
Workshop at ECCV 2020, Glasgow, UK (online event).
data.vision.ee.ethz.ch/cvl/aim20/

2020 **VOT 2020: Visual Object Tracking Challenge**, *Co-organizer*,
Workshop at ECCV 2020, Glasgow, UK (online event).
votchallenge.net/vot2020

2020 **NTIRE 2020: New Trends in Image Restoration and Enhancement**, *Co-organizer*,
Workshop at CVPR 2020, Seattle, USA (online event).
data.vision.ee.ethz.ch/cvl/ntire20/

2020 **AIM 2019: Advances in Image Manipulation**, *Co-organizer*,
Workshop at ICCV 2019, Seoul, South Korea.
data.vision.ee.ethz.ch/cvl/aim19/

2019 **FIRE: From Image Restoration to Enhancement and Beyond**, *Co-organizer*,
Tutorial at ICCV 2019, Seoul, South Korea.
data.vision.ee.ethz.ch/cvl/fire19/

2018 **Discriminative Correlation Filters for Visual Tracking**, *Sole organizer*,
Tutorial at GCPR 2018, Stuttgart, Germany.
gcprvmv2018.vis.uni-stuttgart.de/tutorials.shtml

Open Source Projects

☆ 1200 **PyTracking** github.com/visionml/pytracking
☆ 500 **ECO** github.com/martin-danelljan/ECO
☆ 170 **Continuous-ConvOp** github.com/martin-danelljan/Continuous-ConvOp

Supervision

PhD students (active co-supervisor)

2020 – present **Prune Truong**, ETH Zürich. prunetruong.com

2019 – present **Goutam Bhat**, ETH Zürich. goutamgmb.github.io

2019 – present **Andreas Lugmayr**, ETH Zürich. linkedin.com/in/andreaslugmayr

2019 – present **Ardhendu Shekhar Tripathi**, ETH Zürich.

2019 – present **Fredrik K. Gustafsson**, Uppsala University. fregu856.com

2018 – present **Joakim Johnander**, Linköping University.

Master's Thesis students

I have supervised 8 MSc students at ETH Zürich and 14 at Linköping University. These include:

2020 **Alexandre Carlier**, *ETH Zürich*, github.com/alexandre01.
The thesis work *DeepSVG* was accepted at NeurIPS 2020 github.com/alexandre01/deepsvg.

2019 **Prune Truong**, *ETH Zürich*, PhD student at ETH. prunetruong.com.
The thesis work *GLU-Net* was published at CVPR 2020 as oral presentation.

2019 **Sohyeong Kim**, *ETH Zürich*, PhD student at EPFL.

2018 **Goutam Bhat**, *Linköping University*, PhD student at ETH.
Parts of the work was published at ECCV 2018 and CVPR 2019 as oral presentation.

2016 **Joakim Johnander**, *Linköping University*, PhD student at LiU.

2016 **Susanna Ahlberg (Gladh)**, *Linköping University*, Cybercom.
The thesis work was published at ICPR 2016 and received best paper award.

2014 **Gustav Häger**, *Linköping University*, PhD student at LiU.
Parts of the thesis work was published at BMVC 2014 and TPAMI.

Teaching

2020 **Deep Learning for Image Manipulation**, *ETH Zurich*, lecturer.
Lecturer and design of the course.

2017 – 2018 **Introductory Project Course in Engineering (TFYY51)**, *Linköping University*, lecturer.
Lecturer, along with design and organization of the projects.

2014 – 2018 **Computer Vision (TSBB15)**, *Linköping University*, labs and projects.
Assistant at labs and supervisor of course projects.

2013 – 2018 **Signals and Systems (TSDT18/84)**, *Linköping University*, lessons, labs and exams.
Also performing a short lecture with example exercises as introduction to each lesson.

2018 **Image Analysis (TSBB08)**, *Linköping University*, labs.

2014 – 2018 **Linear Systems (TSKS09/06)**, *Linköping University*, lessons, labs and exams.
Teaching assistant at lessons and labs along with correcting exams.

2012 **Control Theory (TSRT12/22)**, *Linköping University*, lessons, labs and exams.
Teaching assistant at lessons and labs along with correcting exams.

Invited Speaker and Talks

2019 **FIRE: From Image Restoration to Enhancement and Beyond**,
Tutorial at ICCV 2019, Seoul, South Korea.
data.vision.ee.ethz.ch/cvl/fire19/

2019 **The 45th Pattern Recognition and Computer Vision Colloquium**,
Czech Technical University, Prague, Czech Republic.
cmp.felk.cvut.cz/cmp/events/_colloquia/colloquium-2019.10.03

2018 **Discriminative Correlation Filters for Visual Tracking**,
Tutorial at GCPR 2018, Stuttgart, Germany.
gcprvmv2018.vis.uni-stuttgart.de/tutorials.shtml

2018 **Invited talk at Tobii**, *Stockholm, Sweden*.

2016 **Visual Object Tracking Challenge**, *Workshop at ECCV 2016, Amsterdam, Netherlands*.
votchallenge.net/vot2016/program.html

2016 **Invited talk at Kapsch**, *Jönköping, Sweden*.

2015 **Visual Object Tracking Challenge**, *Workshop at ICCV 2015, Santiago, Chile*.
votchallenge.net/vot2015/program.html

2014 **Visual Object Tracking Challenge**, *Workshop at ECCV 2014, Zürich, Switzerland*.
votchallenge.net/vot2014/program.html

Languages

Swedish (native), English (fluent), Armenian (spoken)

Selected Publications

NeurIPS 2020 **DeepSVG: A Hierarchical Generative Network for Vector Graphics Animation**.
Alexandre Carlier, **Martin Danelljan**, Alexandre Alahi, Radu Timofte.
Conference on Neural Information Processing Systems (**NeurIPS**), 2020.

NeurIPS 2020 **GOCor: Bringing Globally Optimized Correspondence Volumes into Your Neural Network**.
Prune Truong, **Martin Danelljan**, Luc Van Gool, Radu Timofte.
Conference on Neural Information Processing Systems (**NeurIPS**), 2020.

ECCV 2020 **Learning What to Learn for Video Object Segmentation**.
Oral, top **2.1%** Goutam Bhat, Felix Järemo Lawin, **Martin Danelljan**, Andreas Robinson, Michael Felsberg, Luc Van Gool, Radu Timofte.
European Conference on Computer Vision (**ECCV**), 2020.

ECCV 2020 **SRFlow: Learning the Super-Resolution Space with Normalizing Flow**.
Spotlight top **5.3%** Andreas Lugmayr, **Martin Danelljan**, Luc Van Gool, Radu Timofte.
European Conference on Computer Vision (**ECCV**), 2020.

ECCV 2020 **Energy-Based Models for Deep Probabilistic Regression**.
Fredrik K Gustafsson, **Martin Danelljan**, Goutam Bhat, Thomas B Schön.
European Conference on Computer Vision (**ECCV**), 2020.

ECCV 2020 **Know Your Surroundings: Exploiting Scene Information for Object Tracking**.
Goutam Bhat, **Martin Danelljan**, Luc Van Gool, Radu Timofte.
European Conference on Computer Vision (**ECCV**), 2020.

ECCV 2020 **Video object segmentation with episodic graph memory networks**.
Spotlight top **5.3%** Xinkai Lu, Wenguan Wang, **Martin Danelljan**, Tianfei Zhou, Jianbing Shen, Luc Van Gool.
European Conference on Computer Vision (**ECCV**), 2020.

BMVC 2020 **How to Train Your Energy-Based Model for Regression**.
Fredrik K Gustafsson, **Martin Danelljan**, Radu Timofte, Thomas B Schön.
British Machine Vision Conference (**BMVC**), 2020.

CVPR 2020 **GLU-Net: Global-Local Universal Network for Dense Flow and Correspondences**.
Oral, top **5.7%** Prune Truong, **Martin Danelljan**, Radu Timofte.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020.

CVPR 2020 **Learning Fast and Robust Target Models for Video Object Segmentation**.
Oral, top **5.7%** Andreas Robinson, Felix Järemo Lawin, **Martin Danelljan**, Fahad Khan, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020.

CVPR 2020 **Probabilistic Regression for Visual Tracking**.
Martin Danelljan, Luc Van Gool, Radu Timofte.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020.

CVPR 2020 **Learning Human-Object Interaction Detection using Interaction Points**.
Tiancai Wang, Tong Yang, **Martin Danelljan**, Fahad Khan, Xiangyu Zhang, Jian Sun.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020.

ICCV 2019 **Learning Discriminative Model Prediction for Tracking**.
Cited by **70**
Oral, top **4.3%** Goutam Bhat, **Martin Danelljan**, Luc Van Gool, Radu Timofte.
IEEE International Conference on Computer Vision (**ICCV**), 2019.

ICCV 2019 **Learning the model update for siamese trackers**.
Lichao Zhang, Abel Gonzalez-Garcia, Joost van de Weijer, **Martin Danelljan**, Fahad Shahbaz Khan.
IEEE International Conference on Computer Vision (**ICCV**), 2019.

BMVC 2019 **Tracking the Known and the Unknown by Leveraging Semantic Information**.
Oral, top **4.7%** Ardhendu Shekhar Tripathi, **Martin Danelljan**, Luc Van Gool, Radu Timofte.
British Machine Vision Conference (**BMVC**), 2019. **Best student paper award**.

CVPR 2019 **ATOM: Accurate Tracking by Overlap Maximization**.
Cited by **130** **Martin Danelljan**, Goutam Bhat, Fahad Khan, Michael Felsberg.
Oral, top **5.6%** IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2019.

CVPR 2019 **A Generative Appearance Model for End-to-end Video Object Segmentation**.
Oral, top **5.6%** Joakim Johnander, **Martin Danelljan**, Emil Brissman, Fahad Khan, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2019.

ECCV 2018 **Unveiling the Power of Deep Tracking**.
Cited by **140** Goutam Bhat, Joakim Johnander, **Martin Danelljan**, Fahad Khan, Michael Felsberg.
European Conference on Computer Vision (**ECCV**), 2018.

CVPR 2018 **Density Adaptive Point Set Registration**.
Oral, top **2.1%** Felix Järemo Lawin, **Martin Danelljan**, Fahad Khan, Per-Erik Forssén, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2018.

PRL 2018 **Deep motion and appearance cues for visual tracking**.
Martin Danelljan, Goutam Bhat, Susanna Gladh, Fahad Shahbaz Khan, Michael Felsberg.
Pattern Recognition Letters, 2018. Special issue invited paper.

CVPR 2017 **ECO: Efficient Convolution Operators for Tracking**.
Cited by **960** **Martin Danelljan**, Goutam Bhat, Fahad Khan, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2017.

PAMI 2017 **Discriminative Scale Space Tracking**.
Cited by **580** **Martin Danelljan**, Gustav Häger, Fahad Khan, Michael Felsberg.
IEEE Transactions on Pattern Analysis and Machine Intelligence, 2017.

ECCV 2016 **Beyond Correlation Filters: Learning Continuous Convolution Operators for Visual Tracking**.
Cited by **990** **Martin Danelljan**, Andreas Robinson, Fahad Khan, Michael Felsberg.
Oral, top **1.8%** European Conference on Computer Vision (**ECCV**), 2016.

ICPR 2016 **Deep Motion Features for Visual Tracking**.
Cited by **50** Susanna Gladh, **Martin Danelljan**, Fahad Khan, Michael Felsberg.
Oral International Conference on Pattern Recognition (**ICPR**), 2016. **Best paper award**.

ICPR 2016 **Aligning the Dissimilar: A Probabilistic Method for Feature-Based Point Set Registration**.
Oral **Martin Danelljan**, Giulia Meneghetti, Fahad Shahbaz Khan, Michael Felsberg.
International Conference on Pattern Recognition (**ICPR**), 2016.

CVPR 2016 **A Probabilistic Framework for Color-Based Point Set Registration**.
Martin Danelljan, Giulia Meneghetti, Fahad Khan, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016.

CVPR 2016 **Adaptive Decontamination of the Training Set: A Unified Formulation for Discriminative Visual Tracking**.
Cited by **270** **Martin Danelljan**, Gustav Häger, Fahad Khan, Michael Felsberg.
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016.

ICCV 2015 **Learning Spatially Regularized Correlation Filters for Visual Tracking**.
Cited by **1180** **Martin Danelljan**, Gustav Häger, Fahad Khan, Michael Felsberg.
IEEE International Conference on Computer Vision (**ICCV**), 2015.

ICCVW 2015 **Convolutional Features for Correlation Filter Based Visual Tracking**.
Cited by **640** **Martin Danelljan**, Gustav Häger, Fahad Khan, Michael Felsberg.
ICCV workshop on the Visual Object Tracking (VOT) Challenge, 2015.

BMVC 2014 **Accurate Scale Estimation for Robust Visual Tracking**.
Cited by **1570** **Martin Danelljan**, Gustav Häger, Fahad Khan, Michael Felsberg.
British Machine Vision Conference (**BMVC**), 2014.

CVPR 2014 **Adaptive Color Attributes for Real-Time Visual Tracking**.
Cited by **1240** **Martin Danelljan**, Fahad Shahbaz Khan, Michael Felsberg, Joost van de Weijer.
Oral, top **5.8%** IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**).