Sergi Caelles

Curriculum Vitae

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Education

2016–2020 **PhD in Computer Vision**,
Advisor: Prof. Luc Van Gool,
Computer Vision Lab,
Eidgenössische Technische Hochschule Zürich (ETH Zürich).

2014–2016 **Master in Telecommunication Engineering**,
Technical School of Telecommunication Superior Engineering of Barcelona (ETSETB),
Technical University of Catalonia (UPC),
Final mark: 9.38/10. Ranked 2nd.

2010–2014 **Degree in Science and Telecommunication Technologies Engineering**,
Technical School of Telecommunication Superior Engineering of Barcelona (ETSETB),
Technical University of Catalonia (UPC),
Final mark: 8.95/10. Ranked 1st.

Working Experience

July 2020 **Research Scientist**, *Perception team*, Google Research.

July 2019 – May 2020 **Research internship**, *Perception team*, Google Research.
Improved video object detection by leveraging graph convolutional networks.

July 2018 – Nov. 2018 **Research internship**, *AR/VR team*, Facebook.
Explored the importance of attribute annotation in images for segmentation.

Sep. 2015 – Feb. 2016 **Research scholarship**, *Institut de Robòtica i Informàtica Industrial*, CSIC-UPC.
Integrated the current planning software (CuikSuite) into ROS.

Jan. 2015 – July 2015 **Teaching assistant**, *Department of Applied Physics*, ETSETB-UPC.
Assisted students in the laboratory, updated the problem set and converted it into LaTeX.

March 2014– Sep. 2014 **Internship**, *Department of Optical Transmission and Networks Research*, Bell Laboratories.
Contributed in the development of the first real-time transmission experiment over a 60-km-long fiber supporting six coupled spatial and polarization modes.

Publications

S. Caelles*, K.-K. Maninis*, J. Pont-Tuset, L. Leal-Taixé, D. Cremers, and L. Van Gool. One-shot video object segmentation. *Computer Vision and Pattern Recognition (CVPR)*, 2017.

J. Pont-Tuset, F. Perazzi, S. Caelles, P. Arbeláez, A. Sorkine-Hornung, and L. Van Gool. The 2017 DAVIS challenge on video object segmentation. *arXiv:1704.00675*, 2017.

K.-K. Maninis*, S. Caelles*, J. Pont-Tuset, and L. Van Gool. Deep extreme cut: From extreme points to object segmentation. *Computer Vision and Pattern Recognition (CVPR)*, 2018.

K.-K. Maninis*, S. Caelles*, Y. Chen, J. Pont-Tuset, L. Leal-Taixé, D. Cremers, and L. Van Gool. Video object segmentation without temporal information. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2018.

S. Caelles, A. Montes, K.-K. Maninis, Y. Chen, L. Van Gool, F. Perazzi, and J. Pont-Tuset. The 2018 DAVIS challenge on video object segmentation. *arXiv:1803.00557*, 2018.

C. Ventura, J. Pont-Tuset, S. Caelles, Y. Chen, K.-K. Maninis, and L. Van Gool. Iterative deep learning for road topology extraction. *British Machine Vision Conference (BMVC)*, 2018.

S. Caelles, J. Pont-Tuset, F. Perazzi, A. Montes, K.-K. Maninis, and L. Van Gool. The 2019 DAVIS challenge on VOS: Unsupervised multi-object segmentation. *arXiv:1905.00737*, 2019.

S. Caelles*, A. Pumarola*, F. Moreno-Noguer, A. Sanfeliu, and L. Van Gool. Fast video object segmentation with spatio-temporal GANs. *arXiv:1903.12161*, 2019.

*First two authors contributed equally.

Organized Workshops

The DAVIS Challenges on Video Object Segmentation, *Co-located with CVPR 17, 18, 19, and 20*. Over the different editions, teams from 15 companies such as Google, DeepMind, Adobe Research, Intel, or Nvidia Research; and from 28 universities such as University of Oxford, ETH Zürich, MPI, or KTH have taken part in the challenges. Moreover, a total of 45,000 USD has been collected from the following sponsoring companies: Google, Disney Research, Nvidia, and Adobe; as well as universities from groups in ETH Zürich and Oregon State University. The datasets released with the challenges have become the standard in the Video Object Segmentation community with more than 200 citations. More information can be found in the *DAVIS website*.

Projects and Thesis

Feb. 2016 – Aug. 2016 **Master thesis**, *Object segmentation in video sequences*, Computer Vision Lab, ETH Zürich.
In this project, the possibility of using the shape of the objects to improve object segmentation algorithms in video sequences is explored.

Sep. 2015 – Jan. 2016 **CBI@CERN**, *Well2Go*, ETSETB-UPC, CERN.
Project carried out in collaboration with business and design students. Our solution, a sensor network able to detect the state of the wells in developing countries, was the winner of the CBI Mediterranean 2015.

May 2015 – Aug. 2015 **Google Summer of Code**, *Run-time partitioning of functions at an embedded SDR framework*.
The main goal of this project was implementing an embedded Linux application in order to make a flexible use of the software and hardware parts of the FPGA-based System-On-Chip (SoC) architecture to develop function splitting in run time.

Mar. 2014 – Jul. 2014 **Bachelor thesis**, *Implementation of DSP algorithms in VHDL for high-speed optical communications*, Bell Laboratories.
The algorithms that were developed such as a parallelized implementation of the discrete Fourier transform were the first steps towards the implementation of a complete real time MIMO receiver.

Sep. 2009 – Oct. 2010 **High school thesis**, *Organization and monitorization of everyday life in an institute*.
Implementation of a platform using a database managed with PHP to help professors with daily tasks.

Honors and Awards

Jun. 2019 **Outstanding Reviewer Award**, *CVPR 2019*.
Award given to reviewers who contributed with excellent reviews.

Oct. 2015 **Master Scholarship**, *Catalunya-La Pedrera Foundation*.
Scholarship granted to the best students of different master programs taught in Catalonia (10.000 euros).

Apr. 2015 **Best student of the Telecommunication degrees**, *ETSETB-UPC*.
Best academic records among the different Telecommunication degrees offered by ETSETB: Science and Telecommunication Technologies, Electronic Systems, Telecommunication Systems, Audiovisual Systems and Telematics.

Oct. 2010 **Second prize**, *XXIII Certamen Jóvenes Investigadores*, Spanish Ministry of Education.
For the project "Organization and monitorization of everyday life in an institute" (3.000 euros).

Personal and Technical Skills

Languages	English (fluent), Spanish (native), Catalan (native).
Programming	Python, LaTeX, C++, MATLAB, Java, VHDL.
Deep learning	PyTorch, Tensorflow, Caffe.
Reviewer	CVPR 2018, 2019, 2020; T-PAMI; ICCV 2019; ECCV 2020; ICRA 2019; IROS 2020.