

Dr. Hoel Kervadec

Post-doctoral researcher

Current positions

- 2021–ongoing **Post-doctoral researcher**, *Erasmus MC*, Rotterdam.
Within the BGR group, under the supervision of Marleen de Bruijne.
- 2021–ongoing **Publishing editor**, *MELBA journal*.

Education

- 2017-2020 **PhD candidate**, *ÉTS*, Montréal, Canada.
Supervisors: Ismail Ben Ayed, Jose Dolz, Éric Granger
Weakly supervised image segmentation applied to medical imaging or natural image [1, 3, 5, 9, 10, 11, 12]. We reframe the training of neural networks as a constrained optimization problem, to enforce prior knowledge about the problem, leveraging weak labels in a more effective way.
Several of our papers were **selected for talks** [5, 9, 12] at prestigious conferences, and my collaborations led to several additional publications [4, 6, 7, 8].
Graduated **with highest honors**.
- 2013-2016 **Engineering degree in computer science**, *INSA Rennes*, France.
Three years of computer science, emphasis on maths and machine learning.
- 2015-2016 **Master for Research in computer science**, *Université Rennes 1*, France.
Specialized in machine learning, in parallel to my engineering degree
- Spring 2015 **Erasmus semester**, *Luleå tekniska universitet*, Sweden.
- 2011-2013 **Preparatory cycle**, *INSA Rennes*, France.
Two years of general training, working in pairs with exchange students.

Awards and distinctions

- 2021 **Best paper award**, *MIDL 2021*, Top paper of the conference, Beyond pixel-wise supervision: semantic segmentation with higher-order shape descriptors [2].
- 2020 **Outstanding reviewer award**, *MIDL 2020*, Top 5 reviewer among 200.
- 2019 **MedIA special issue**, *MIDL 2019*, Top 20% of accepted papers, Boundary loss for highly unbalanced segmentation [9].
We were invited to submit an extended version of our paper to the Medical Image Analysis journal, published in volume 67 [3].
- 2019 **Runner-up for best paper award**, *MIDL 2019*, Top 3 of accepted papers, Boundary loss for highly unbalanced segmentation [9].
- 2018 **MedIA special issue**, *MIDL 2018*, Top 20% of accepted papers, Size-constraint loss for weakly supervised CNN segmentation [12].
We were invited to submit an extended version of our paper to the Medical Image Analysis journal, published in volume 54 [11].

- 2018 **CIFAR travel award**, *MIDL 2018*, Top 50% of accepted papers, Size-constraint loss for weakly supervised CNN segmentation [12].
Travel grant awarded to the best publications from students as first authors

Past experience

- Early 2021 **Post-doctoral researcher**, *CRCHUM, Montreal*.
- 2019–2020 **Virtual arrangements chair**, *MIDL 2020*.
I installed and managed all the technology stack (website, online chat, video-conference) for the whole virtual conference. We managed to make registrations free, getting more than 3000 registrations from all over the world.
- 2017–2018 **System administrator**, *LightOn, Paris*, Part time.
I was administrating remotely machines in an OVH data-center and setting up an OpenStack cluster.
- Early 2017 **Research engineer**, *LightOn, Paris*.
I worked on many tasks, involving hardware interface, server administration, IT management, and formation for the team in IT tools.
- Spring 2016 **Intern**, *Inria, Rennes*, Linkmedia team.
Head: Guillaume Gravier, Supervisor: Yannis Avrithis
We started to develop a new approach for object detection using CNNs and the Hough Transform.
We used the Caffe framework, with a combination of Python and Bash.
- Spring 2016 **Freelance**, *InPixal, Rennes*.
I extended the live555 streaming library to support dynamic playlists. This will be used in embedded surveillance devices.
This was done in C and C++.
- Summer 2015 **Intern**, *Imperial College London, BioMedIA team*.
Head: Daniel Rueckert, Supervisor: Jonathan Passerat-Palmbach
Developed a machine learning approach to optimize the load balancing of jobs within an heterogeneous distributed computing environment.
- Summer 2014 **Intern**, *AT&T Labs, Bedminster, NJ, USA, Cloud Computing Service*.
Supervisor: Matti Hiltunen
I had to find attack vectors on Ceilometer (OpenStack's component), design and implement solutions to prevent them. Most of the work was done in Python.
- Summer 2013 **Intern**, *Inria, Rennes, ASAP team*.
Head: A.M. Kermarrec, Supervisor: François Taiani
I implemented a topology construction algorithm (Polystyrene on top of T-Man) in the PeerSim simulator (used Scala for this project). I contributed to a paper on the algorithm [13].

Invited talks

- July 2018 **“Size-constraint loss for weakly supervised cnn segmentation”**, *Linkmedia team, Inria Rennes, France*.
- September 2019 **“Boundary loss for high-imbalanced segmentation”**, *Xidian university, Xi'an, China*.
- October 2019 **“Boundary loss for high-imbalanced segmentation”**, *SIAT, Shenzhen, China*.
- January 2021 **“Constrained-CNN for weakly supervised segmentation”**, *Probabilistic Vision Group, McGill university, Canada*.
- December 2021 **“How to write an award-winning paper”**, *MIDL winter-workshop, online*.

- February 2022 “**Beyond pixel-wise supervision: semantic segmentation with few shape descriptors**”, *Gdr ISIS workshop*, CNRS Villejuif.
- March 2022 “**Beyond pixel-wise supervision: semantic segmentation with few shape descriptors**”, *SIAM Conference on Imaging Science (IS22) Segmentation Mini-symposium*, Online.

References

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