Assistant Lecturer in Computer Vision and Deep Learning

Pierre
JACOB

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About me

I got my Ph.D. in Computer Vision and Deep Learning from Cergy-Paris University under the supervision of Aymeric Histace (ETIS, ENSEA), David Picard (Ecole des Ponts ParisTech) and Edouard Klein (French National Police Forces), working on fine-grained content-based image retrieval using supervised metric learning.

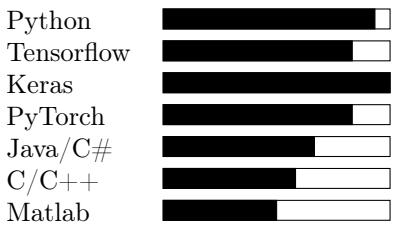
I worked as a postdoctoral researcher at Czech Technical University in Prague under the supervision of Ondrej Chum and Giorgos Tolias. I worked on large-scale and instance-based image retrieval applications, with a focus on representation learning for local features.

Currently, I am an Assistant Lecturer (ATER in France) at ENSEA where I teach Computer Science and do research under the supervision of Aymeric Histace and Camille Simon-Chane (ETIS, ENSEA). I work on representation learning for event-based action recognition and human pose estimation, with a focus on graph convolutional neural networks.

Languages

French	Native speaker
English	Proficient

Programming Languages and Frameworks



Education

Mar. 2017 – Sept. 2020
Paris Area, France

Ph.D. at CY Paris University

- Title: "High-Order Statistics for Image Representations using Metric Learning"
- Supervisors: Aymeric Histace (ETIS, ENSEA), David Picard (LIGM, Ecole des Ponts Paristech) and Edouard Klein (National Police Forces)
- Global pooling (bilinear pooling, high-order pooling, dictionary learning, attention models)
- Deep metric learning (example generation with GANs, regularization methods)

Sept. 2015 – Sept. 2016
Paris Area, France

MSc at Cergy-Pontoise University

- MSc in Computer Science with honors
- Major: Artificial Intelligence and Robotics
- Minor: Image Processing

Sept. 2013 – Sept. 2016
Paris Area, France

MSc at ENSEA Engineering School

- A three-year program in a French engineering gradutate school
- Graduated with high honors
- Major: Electronics and Embedding Systems
- Minors: Multi-physic simulation, signal processing, System-on-Chip

Work History

Oct. 2021 – Present
Paris Area, France

Assistant Lecturer (ATER) at ENSEA

- Teaching: Computer Science
- Research: Representation Learning of event-based data for action recognition or human pose estimation using graph neural networks

Sept. 2020 – Oct. 2021
Prague, Czech Republic

Postdoctoral Researcher at Czech Technical University Prague

- Topic: Large-scale Instance-based Image Retrieval
- Tasks: Deep learning extension of Query Expansion & Learning local features in an end-to-end fashion

Apr. 2016 – Oct. 2016
Angers Area, France

R&D Intern at Limagrain Group

- Topic: Automatic seed recognition and disease detection using machine learning and multispectral imaging
- Tasks: Real-time implementation of standard machine learning algorithms (Matlab and C#) on a prototype (more than 5 seeds per second)

July 2015 – Sept. 2015
Paris Area, France

Research Engineer Intern at ETIS laboratory

- Topic: 3D-printed hand design with Solidworks and motorization for grasping tasks
- Tasks: Realization of an electronic board, motor control commands from USB, and their integration into the lab's software

Others

Student supervision

- Bachelor students' internships or projects supervision in computer vision (mostly on NVIDIA Tegra boards): mimic the Terminator vision, person re-id for augmented airsoft helmet, iris recognition, automatic pytorch to tensorflow model code converter, hardware implementation of convolutions, *etc.*.
- Pauline Vasseur: **1 publication** during her 6th month internship
- Marc Souchaud: **1 publication** during his 6th month internship
- Gaetan Raynaud: **1 publication** during his 6th month internship

Teaching

Oct. 2021 – Aug. 2021, Paris Area, France

Assistant Lecturer at ENSEA

- 176h of teaching in Computer Science
- Topics: C/C++, Java, Unix system programming, parallel programming, microprocessor, network

Sept. 2018 – Sept. 2020, Paris Area, France

Part-Time Lecturer at EISTI

- Responsible for teaching an introduction course on pattern recognition (28h per year): machine learning algorithms, feature matching and aggregation, deep learning
- Python toolkits: scikit-lean and image, numpy, tensorflow

Sept. 2017 – Sept. 2020, Paris Area, France

Part-Time Lecturer at ENSEA

- Practical work supervisor for a Linux kernel programming course
- Responsible for teaching the course "Artificial Intelligence for Optimal Control" (16h per year)

References

Aymeric Histace (Ph.D. Supervisor)

- Full Professor, Head of Research, Innovation and Partnerships and Deputy Director at ENSEA
- Address: 6 Avenue du Ponceau, 95000 Cergy, France
- Phone: (+33) 6–61–15–84–90
- E-mail: aymeric.histace@ensea.fr

David Picard (Ph.D. Advisor)

- Senior Researcher at Ecole des Ponts ParisTech
- Address: 6-8 Avenue Blaise Pascal, 77420 Champs-sur-Marne, France
- Phone: (+33) 6–79–64–11–96
- E-mail: david.picard@enpc.fr

Publications

[1] Pierre Jacob, David Picard, Aymeric Histace, and Edouard Klein. Diablo: Dictionary-based attention block for deep metric learning. *Pattern Recognition Letters*, 2020.

[2] Pierre Jacob, David Picard, Aymeric Histace, and Edouard Klein. Improving deep metric learning with virtual classes and examples mining. In *arXiv preprint arXiv:2006.06611*, 2020.

[3] Pierre Jacob, David Picard, Aymeric Histace, and Edouard Klein. Efficient codebook and factorization for second order representation learning. In *International Conference on Image Processing (ICIP)*, 2019.

[4] Pierre Jacob, David Picard, Aymeric Histace, and Edouard Klein. Metric learning with horde: High-order regularizer for deep embeddings. In *International Conference on Computer Vision (ICCV)*, 2019.

[5] Romain Leenhardt, Pauline Vasseur, Cynthia Li, Jean Christophe Saurin, Gabriel Rahmi, Franck Cholet, Aymeric Becq, Philippe Marteau, Aymeric Histace, Xavier Dray, et al. A neural network algorithm for detection of gi angiectasia during small-bowel capsule endoscopy. *Gastrointestinal endoscopy*, 2019.

[6] Gaetan Raynaud, Pierre Jacob, Camille Simon-Chane, and Aymeric Histace. Active contour segmentation based on histograms and dictionary learning for videocapsule image analysis. In *International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAAP)*, 2019.

[7] Pierre Jacob, David Picard, Aymeric Histace, and Edouard Klein. Leveraging implicit spatial information in global features for image retrieval. In *International Conference on Image Processing (ICIP)*, 2018.

[8] Marc Souchaud, Pierre Jacob, Camille Simon-Chane, Aymeric Histace, Oliver Romain, Maurice Tchuenté, and Denis Sereno. Mobile phones hematophagous diptera surveillance in the field using deep learning and wing interference patterns. In *International Conference on Very Large Scale Integration (VLSI-SoC)*, 2018.