Researcher in Computer Vision and Deep Learning

Pierre
JACOB

Paris Area, France
(+33) 6 62 41 64 80
pierre.jacob@ensea.fr
/in/pierre-jacob
github.com/pierre-jacob
pierre-jacob.github.io

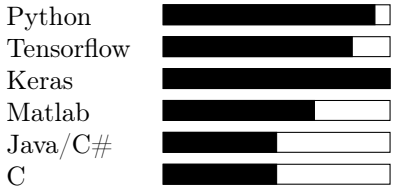
About me

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). My current researches are focused on content-based image retrieval using supervised metric learning. I use diverse techniques such as second and high order representation learning, dictionary learning or attention-based approaches to learn image representations.

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

Apr. 2016 – Oct. 2016
Angers Area, France

R&D Intern at Limagrain Group

- Automatic seed recognition and disease detection using machine learning and multispectral imaging
- Re-implementation of GMMs, LDA in Matlab/C#
- Real-time implementation on a prototype (more than 5 seeds per second)

July 2015 – Sept. 2015
Paris Area, France

Research Engineer Intern at ETIS laboratory

- 3D-printed hand design with Solidworks and motorization for grasping tasks
- Realization of electronic board and motor control commands from USB
- 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

Sept. 2018 – Sept. 2020
Paris Area, France

Part-Time Professor in Pattern Recognition at EISTI School of Engineering

- Responsible for teaching an introduction course concerning pattern recognition (28h per year)
- Machine learning algorithms (SVM, LDA, GMM, regression, *etc.*), feature matching and aggregation (BoVW, VLAD), deep learning
- Python toolkits: scikit-lean and image, numpy, tensorflow and keras.

Sept. 2017 – Sept. 2020
Paris Area, France

Part-Time Professor in Computer Science at ENSEA School of Engineering

- Practical work supervisor for a Linux kernel programming course: Shell and FTP development in C (16h per year)
- 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.