

# Curriculum Vitae

Mathieu Aubry

April 2019

## Personnal information

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Nationality	French
Birth date	May 1st, 1987

## Professionnal Experiences

**Sept 2014-present, École des Ponts ParisTech (ENPC, Champs-sur-Marne, France)**

Permanent researcher in computer vision, associate Professor.

**Jan 2015-Dec 2015, University of California, Berkeley (Berkeley, CA, United States)**

Visiting scholar with Alexei Efros.

**Oct 2011-May 2015, WILLOW team at INRIA-ENS (Paris, France) and CVPR group at TU München (Munich, Germany)**

PhD on the analysis of 3D shapes and their relationship to 2D depictions (including paintings and drawings).

**Oct 2011-Apr 2012, TU München (Munich, Germany)**

Associate researcher in the Computer Vision and Pattern Recognition group of Daniel Cremers, working on 3D shape descriptions and supervising a seminar on feature descriptors.

**Feb 2011-Sept 2011, Adobe System Inc. (Cambridge, MA, United States)**

Intern under the supervision of Sylvain Paris (Adobe) and Frédo Durand (MIT), working on detail manipulation in images and image statistics.

**Aug 2010-Dec 2010, TU München (Munich, Germany)**

Associate researcher in the Computer Vision and Pattern Recognition group of Daniel Cremers, working on camera calibration and 3D shape descriptions.

**Apr 2009-Aug 2009, University of California, Berkeley (Berkeley, CA, United States)**

Visiting scholar, working in the linguistics department with Georges Lakoff on the mathematical understanding and representation of space (research internship prize from École Polytechnique).

## Education

**PhD in Computer Science (May 2015).**

ENS (Paris, France)

co-advised by Josef Sivic (INRIA) and Daniel Cremers (TUM)

**Master degree in Mathematics, Vision and Machine Learning.**

ENS Cachan (Cachan, France)

**Engineering degree (Mathematics and Informatics).**

École des Ponts ParisTech (ENPC, Champs-sur-Marne, France)

**Engineering degree (Fundamental Physics and Biology).**

École Polytechnique (Palaiseau, France)

## Students and Teaching

**PhD students:**

- Francisco Massa (2014 - 2017 - now at FAIR)
- Vianney Loing (2015-2018, in Mechanical Engineering, with Jean-François Caron, Olivier Baverel and Renaud Marlet)
- Théophile Dalens (since 2015 - graduation expected 2019, with Josef Sivic)
- Thibault Groueix (since 2016)
- Xi Shen (since 2017)
- Othman Sbaï (since 2018, with Camille Couprie in CIFRE at FAIR)
- Théo Deprelle (since 2018)
- Simon Roburin (since 2019, with Patrick Perez and Renaud Marlet, in CIFRE at Valeo AI)

**Interns (>5 months):**

Karan Dwivedi, Pierre-Alain Langlois, Thomas Belos, David Tidmarsh, Théo Deprelle, Sophie Bodenes, Oumayma Bounou, Tom Monnier.

### **Lectures:**

- responsible for the *Introduction to Computer Vision* course from ENS (~ 30h/year, since 2017)
- in the MVA master from ENS Cachan (~ 5h/year, *3D reconstruction* and *Object recognition* lectures, since 2015)
- in the Engineering curriculum from ENPC (~ 20h/year *Signal processing and computer vision*, *Machine Learning* and *Computer Vision for Mechanics of Materials* lectures, since 2015 ).

## **Funding**

### **Gifts from Adobe, 2015-2019**

9 gifts resulting from collaborations with Bryan Russell, Matthew Fisher and Vladimir Kim.

### **RAPID Tabasco, 2015-2019**

joint project on low-shot Deep Learning with Deepomatic and Airbus.

### **ANR JCJC EnHerit, 2018-2022**

funded project on Enhancing Heritage Image Databases.

### **CIFRE with FAIR, 2018-2021**

associated to the PhD of Othman Sbaï and collaboration with Camille Couprie.

### **CIFRE with Valeo AI, 2019-2022**

associated to the PhD of Simon Roburin and collaboration with Patrick Perez.

## **Other**

### **Languages**

French, English, German. Notions of Russian, Spanish, Latin and ancient Greek.

### **Personal Interest**

History, art, photography, cognitive sciences, swimming.

## Publications

More than 1400 citations, h-index 14, 9 papers cited more than 50 times (source: Google Scholar )

### With Daniel Cremers

- [1] Mathieu Aubry, Ulrich Schlickewei, and Daniel Cremers. “Pose-consistent 3d shape segmentation based on a quantum mechanical feature descriptor”. In: *Joint Pattern Recognition Symposium*. Springer, Berlin, Heidelberg. 2011.
- [2] Mathieu Aubry, Ulrich Schlickewei, and Daniel Cremers. “The wave kernel signature: A quantum mechanical approach to shape analysis”. In: *Computer Vision Workshops (ICCV Workshops), 2011 IEEE International Conference on*. IEEE. 2011.
- [3] Mathieu Aubry, Kalin Kolev, Bastian Goldluecke, and Daniel Cremers. “Decoupling photometry and geometry in dense variational camera calibration”. In: *Computer Vision (ICCV), 2011 IEEE International Conference on*. IEEE. 2011.
- [4] Mathieu Andreux, Emanuele Rodola, Mathieu Aubry, and Daniel Cremers. “Anisotropic Laplace-Beltrami Operators for Shape Analysis”. In: *Computer Vision-ECCV 2014 Workshops*. Springer International Publishing. 2014.
- [5] Bastian Goldlücke, Mathieu Aubry, Kalin Kolev, and Daniel Cremers. “A super-resolution framework for high-accuracy multiview reconstruction”. In: *International journal of computer vision* (2014).

### With Josef Sivic

- [6] Mathieu Aubry, Bryan C Russell, and Josef Sivic. “Painting-to-3D model alignment via discriminative visual elements”. In: *ACM Transactions on Graphics (TOG)* (2014).
- [7] Mathieu Aubry, Bryan C Russell, and Josef Sivic. “Where was this picture painted?-Localizing paintings by alignment to 3D models”. In: *Reconnaissance de Formes et Intelligence Artificielle (RFIA)*. 2014.
- [8] Mathieu Aubry, Daniel Maturana, Alexei Efros, Bryan Russell, and Josef Sivic. “Seeing 3D chairs: exemplar part-based 2D-3D alignment using a large dataset of CAD models”. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*. 2014.
- [9] Mathieu Aubry, Bryan Russell, and Josef Sivic. “Visual Geo-localization of Non-photographic Depictions via 2D–3D Alignment”. In: *Large-Scale Visual Geo-Localization*. Springer International Publishing, 2016.

- [10] Zagoruyko Sergey, Yann Labbé, Igor Kalevatykh, Ivan Laptev, Justin Carpentier, Mathieu Aubry, and Josef Sivic. “Monte-Carlo Tree Search for Efficient Visually Guided Rearrangement Planning”. In: *arXiv preprint arXiv:1904.10348* (2019).

### **Without PhD advisors**

- [11] Mathieu Aubry, Sylvain Paris, Samuel W Hasinoff, Jan Kautz, and Frédo Durand. “Fast Local Laplacian Filters: Theory and Applications”. In: *ACM Transactions on Graphics (TOG)* (2014).
- [12] Mathieu Aubry and Bryan C Russell. “Understanding deep features with computer-generated imagery”. In: *Proceedings of the IEEE International Conference on Computer Vision*. 2015.
- [13] Jeffrey Mahler, Florian T Pokorny, Brian Hou, Melrose Roderick, Michael Laskey, Mathieu Aubry, Kai Kohlhoff, Torsten Kröger, James Kuffner, and Ken Goldberg. “Dex-net 1.0: A cloud-based network of 3d objects for robust grasp planning using a multi-armed bandit model with correlated rewards”. In: *2016 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2016.
- [14] Francisco Massa, Bryan C Russell, and Mathieu Aubry. “Deep exemplar 2d-3d detection by adapting from real to rendered views”. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*. 2016.
- [15] Rodrigo Ortiz-Cayon, Abdelaziz Djelouah, Francisco Massa, Mathieu Aubry, and George Drettakis. “Automatic 3D Car Model Alignment for Mixed Image-Based Rendering”. In: *3D Vision (3DV), 2016 Fourth International Conference on*. IEEE. 2016.
- [16] Tinghui Zhou, Philipp Krahenbuhl, Mathieu Aubry, Qixing Huang, and Alexei A Efros. “Learning dense correspondence via 3d-guided cycle consistency”. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*. 2016.
- [17] Vianney Loing, Renaud Marlet, and Mathieu Aubry. “Virtual Training for a Real Application: Accurate Object-Robot Relative Localization Without Calibration”. In: *International Journal of Computer Vision* (2017).
- [18] Johanna Delanoy, Mathieu Aubry, Phillip Isola, Alexei Efros, and Adrien Bousseau. “3D Sketching using Multi-View Deep Volumetric Prediction”. In: *Proceedings of the ACM on Computer Graphics and Interactive Techniques* (2018).
- [19] Shiry Ginosar, Xi Shen, Karan Dwivedi, Elizabeth Honig, and Mathieu Aubry. “The burgeoning computer-art symbiosis”. In: *XRDS: Crossroads, The ACM Magazine for Students* (2018).
- [20] Thibault Groueix, Matthew Fisher, Vladimir G Kim, Bryan C Russell, and Mathieu Aubry. “AtlasNet: A Papier-Mâché Approach to Learning 3D Surface Generation”. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*. 2018.

- [21] Thibault Groueix, Matthew Fisher, Vladimir G Kim, Bryan C Russell, and Mathieu Aubry. “Shape correspondences from learnt template-based parametrization”. In: (2018).
- [22] Othman Sbai, Camille Couprie, and Mathieu Aubry. “Vector Image Generation by Learning Parametric Layer Decomposition”. In: *arXiv preprint arXiv:1812.05484* (2018).
- [23] Xi Shen, Alexei A Efros, and Aubry Mathieu. “Discovering Visual Patterns in Art Collections with Spatially-consistent Feature Learning”. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (2019).

## **Patents**

Wave Kernel Signature (2012, with Ulrich Schlickewei and Daniel Cremers, by TU Munich)  
Automated method of recognition of an object (2018, with Pierre-Alain Langlois, by Pzartech)