

Curriculum Vitae

Mathieu Aubry

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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).

Diploma

Habilitation à diriger des recherches (2019).

UPE (Marne la Vallée, France)

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, now at Arcure)
- Théophile Dalens (2015 - 2019, with Josef Sivic, now at Grabango)
- Thibault Groueix (since 2016 - graduation expected September 2020)
- 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)
- Tom Monnier (since 2020)

Interns (Masters and > 5 months):

Karan Dwivedi, Pierre-Alain Langlois, Thomas Belos, David Tidmarsh, Théo Deprelle, Sophie Bodenes, Oumayma Bounou, Tom Monnier, Elliot Vincent, Ryad Kaoua, Van Nguyen Nguyen, Virginie Loison, Xiwei Hu.

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.

Professional Services

Area Chair

for CVPR 2018, CVPR 2020, ACCV 2021, MVA 2021.

Reviewing

approximately 30 papers a year, for CVPR, ECCV, ICCV, NeurIPS, ICML, ICLR and occasionally for other conferences and journals. Among the top rated reviewers for CVPR 2019 and NeurIPS 2019.

PhD committee

Mihir Sahasrabudhe (CentraleSupélec, 2020), Geoffrey Daniel (CEA, 2020, rapporteur).

Other

Languages

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

Personal Interest

History, art, photography, cognitive sciences, swimming.

Publications

More than 2400 citations, h-index 18, 7 papers cited more than 100 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] Dalens Théophile, Mathieu Aubry, and Josef Sivic. “Bilinear image translation for temporal analysis of photo collections”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2019).
- [11] Yann Labbé, Sergey Zagoruyko, Igor Kalevtykh, Ivan Laptev, Justin Carpentier, Mathieu Aubry, and Josef Sivic. “Monte-carlo tree search for efficient visually guided rearrangement planning”. In: *IEEE Robotics and Automation Letters* 5.2 (2020), pp. 3715–3722.

Without PhD advisors

- [12] 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).
- [13] Mathieu Aubry and Bryan C Russell. “Understanding deep features with computer-generated imagery”. In: *Proceedings of the IEEE International Conference on Computer Vision*. 2015.
- [14] 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.
- [15] Francisco Massa, Renaud Marlet, and Mathieu Aubry. “Crafting a multi-task CNN for viewpoint estimation”. In: *British Machine Vision Conference*. British Machine Vision Association. 2016.

- [16] 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.
- [17] 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.
- [18] 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.
- [19] 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).
- [20] 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).
- [21] 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).
- [22] 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.
- [23] Thibault Groueix, Matthew Fisher, Vladimir G Kim, Bryan C Russell, and Mathieu Aubry. “Shape correspondences from learnt template-based parametrization”. In: *Proceedings of the European Conference on Computer Vision (ECCV)*. 2018.
- [24] Thibault Groueix, Matthew Fisher, Vova Kim, Bryan Russell, and Mathieu Aubry. “Unsupervised cycle-consistent deformation for shape matching”. In: *Symposium on Geometry Processing (SGP)*. 2019.
- [25] 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).
- [26] Deprelle Théo, Thibault Groueix, Matthew Fisher, Vova Kim, Bryan Russell, and Mathieu Aubry. “Learning elementary structures for 3D shape generation and matching”. In: *Advances in Neural Information Processing Systems*. 2019.
- [27] Yang Xiao, Xuchong Qiu, Pierre-Alain Langlois, Mathieu Aubry, and Renaud Marlet. “Pose from Shape: Deep Pose Estimation for Arbitrary 3D Objects”. In: *British Machine Vision Conference (BMVC)*. 2019.

- [28] Tom Monnier and Mathieu Aubry. “docExtractor: An off-the-shelf historical document element extraction”. In: *International Conference on Frontiers in Handwriting Recognition (ICFHR)*. IEEE. 2020.
- [29] Othman Sbai, Camille Couprie, and Mathieu Aubry. “Impact of base dataset design on few-shot image classification”. In: *Proceedings of the European Conference on Computer Vision (ECCV)*. 2020.
- [30] Othman Sbai, Camille Couprie, and Mathieu Aubry. “Vector Image Generation by Learning Parametric Layer Decomposition”. In: *2016 IEEE international conference on image processing (ICIP)*. IEEE. 2020.
- [31] Xi Shen, François Darmon, Alexei A Efros, and Mathieu Aubry. “RANSAC-Flow: generic two-stage image alignment”. In: *Proceedings of the European Conference on Computer Vision (ECCV)*. 2020.

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)