Vincent LEPETIT
Full Professor, University of Bordeaux

Contact

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Professional Experience

- From December 2016: **Full Professor** (*Professeur*) at University of Bordeaux, France.
- February 2014-November 2016: **Full Professor** (*Universitätsprofessor*) at TU Graz, Austria.
- February 2014-January 2016: **Invited Professor** at EPFL, Switzerland.
- 2005-2014: **Research and Teaching Associate**, CVLab, EPFL.

Current Research Interests

Deep Learning, Computer Vision, 3D Object Detection and Recognition, Augmented Reality

Awards

Google Research Award for "Geometry-aware CNNs for Non-Rigid Shape Reconstruction", 2017;

Best Paper Award for "Learning to Align Semantic Segmentation and 2.5D Maps for Geolocalization", Joint Urban Remote Sensing Event, 2017;

Google Research Award for "Learning to Generate Training Images for 3D Object Recognition", 2015;

Best Full Paper Award for "Instant Outdoor Localization and SLAM Initialization from 2.5D Maps", IEEE International Symposium in Mixed and Augmented Reality (ISMAR), 2015;

Google Research Award for "Approximate Nearest Neighbor Search for Binary Descriptors", 2011;

Best Paper Prize for "Real-Time Non-Rigid Surface Detection", IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2005.

Best Demonstration Prize for "Golf Club Visual Tracking for Enhanced Swing Analysis Tools", British Machine Vision Conference, Norwich, UK, September 2003.

Editorial and Conference Duties

Associate Editor for the International Journal in Computer Vision (**IJCV**), the Computer Vision and Image Understanding (**CVIU**) journal, and the Computer Animation and Virtual Worlds (CAVW) journal.

Program Chair for the *Asian Conference on Computer Vision* (**ACCV**) in 2016.

Area Chair for the Conference on *Computer Vision and Pattern Recognition* (**CVPR**) in 2011, 2013 and 2015, for the *European Conference on Computer Vision* (**ECCV**) in 2010, 2014, and 2016 for the *Asian Conference on Computer Vision* (**ACCV**) in 2012 and 2014, for the *International Conference on Pattern Recognition* (ICPR) in 2014, and for the International Symposium on Mixed and Augmented Reality (ISMAR) in 2007 and 2009.

General Chair for the International Symposium on Mixed and Augmented Reality (ISMAR) in 2011, and **Program Chair** in 2010.

External Funding

Semantic 3D Computer Vision, Christian Doppler Laboratory. 390,000 euros/year. Starting in 2016, renewable over 7 years.

Learning to Generate Training Images for 3D Object Recognition, 2015, Google Research Award, $70,000 USD.

FP7 European Project, Magellan: a Multimodal Authoring and Gaming Environment for Location-based coLlaborative AdveNtures (2013 to 2017).

ITN European Project, EDUSAFE: Education in advanced VR/AR Safety Systems for Maintenance in Extreme Environments (2012 to 2016).

Honeywell private project (2012 to 2016).

View Sets for 3D Object Detection and Recognition, Principal Investigator, SNF Project, about 93,000 Swiss Francs (65,000 Euros) every two years (2005-2013).

Better Local Image Descriptors for Mobile Devices, 2011-2012, Qualcomm Gift, $160,000 USD.

Approximate Nearest Neighbor Search for Binary Descriptors, 2011, Google Research Award, $83,000 USD.

Advanced Computer Vision and Visual Languages for Broader Markets in Augmented Reality, January 2011-June 2012, Principal Investigator, CTI Project, about 284,000 Swiss Francs (212,000 Euros).

Understanding Brain Morphogenesis: Computer Vision Morphological Feature Extraction and a Machine Learning Approach to Study the Molecular and Environmental Factors Regulating Neuronal Development, starting October 2009, Co-Investigator, about 400,000 Swiss Francs (260,000 Euros).

Fine and Robust Segmentation of Adult-Born Neurons Development in 4D Two-Photon Microscopy, 2008-2009, Principal Investigator, IPP project (SystemsX Interdisciplinary Pilot Project), about 95,000 Swiss Francs (65,000 Euros).

Participations to European Projects

MAGELLAN: a Multimodal Authoring and Gaming Environment for Location-based coLlaborative AdvenNtures (2013 to 2017).

EDUSAFE: Education in advanced VR/AR Safety Systems for Maintenance in Extreme Environments (2012 to 2016).

myCopter: Enabling Technologies for Personal Aerial Transportation Systems (2011 to 2015).

PEGASE: HelicoPter and aEronef naviGation Airborne System Experimentations (2006 to 2009).

DYVINE: DYnamic VIsual NEtwork (2006 to 2009).

PHAROS: Platform for searcHing of Audiovisual Resources across Online Spaces (2006 to 2009).

STAR: Service Training through Augmented Reality (2001 to 2004).

VIBES: Video Browsing, Exploration and Structuring (2001 to 2004).

PhD Students

Alexander Grabner (100%): Deep Networks Optimization, started in 2016;

Mahdi Rad (100%): Textureless 3D object detection, 2014 to present;

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Markus Oberweger (100%): 3D hand detection, 2014 to present;

Anil Armagan (100%): Outdoor camera registration, 2014 to present;

Bugra Tekin (50%): 3D Human body motion, 2014 to present.

Artem Rozantsev (70%): Flying object identification, 2012 to present.

Amos Sironi (70%): Learning to extract image features, 2012 to graduation in 2016.

Alberto Crivellaro (100%): Camera tracking in industrial environment, 2012 to graduation in 2016.

Tomasz Trzcinski (90%): Binary descriptor learning, 2010 to graduation in 2014.

Roberto Rigamonti (90%): Low-level feature learning, 2009 to graduation in 2013.

Michael Calonder (90%): Feature point recognition for SLAM applications, 2008 to graduation in 2011.

Mustafa Özuysal (90%): Generic Object Detection, 2004 to graduation in 2010.

Julien Pilet (70%): Automated Tracking Algorithms, 2004 to graduation in 2008.

Ali Shahrokni (70%): Monocular Body Tracking, 2001 to graduation in December 2005. In the context of the VIBES (human body tracking in monocular sequences) European project.

Luca Vacchetti (70%): 3D Tracking in Complex Environments for Augmented Reality Applications, 2001 to graduation in November 2004. In the context of the STAR (3D object tracking for Augmented Reality application) European project.

Recent Invited Talks

"Computer Vision Pipelines and Deep Learning", Google, Mountain View, USA, October 25, 2016.

"LIFT: Learned Invariant Feature Transform", 'Local Features' workshop, ECCV, Amsterdam, October 10, 2016.

"Principled Computer Vision Pipelines with Deep Learning", Imperial College London, United-Kingdom, September 14, 2016.

"Hands Deep in 3D Hand Pose Estimation", HANDS workshop, CVPR, Las Vegas, USA, July 1st, 2016.

"Machine Learning Techniques for 3D Registration from Images", Google Zurich, Switzerland, June 7, 2016.

Publications

Number of citations: 13306, **H-index: 46**, **i10-index: 99**

Google Scholar: https://scholar.google.com/citations?user=stx-TZwAAAAJ&hl=en

Most of my papers were published in the main journals and conferences in computer vision:

- **9 papers** in the IEEE Transactions of Pattern Analysis and Machine Intelligence (PAMI - **ISI impact factor 2015: 6.077**);

- **3 papers** in the International Journal on Computer Vision (IJCV - **ISI impact factor 2015: 4.278**);

- **3 papers** in the Computer Vision and Image Understanding journal (CVIU - **ISI impact factor 2015: 2.134**).

- **51 papers** at top-tier conferences (CVPR, ICCV, ECCV), including **13 orals**. The **selection rates** for these conferences are between **20% and 30%**, and between **3% and 6% for oral presentations**.

Selected Recent Publications

[1] A. Armagan, M. Hirzer, and V. Lepetit. "Semantic Segmentation for 3D Localization in Urban Environments". In: *Joint Urban Remote Sensing Event*. **Best Paper Award**. 2017.

[2] A. Armagan, M. Hirzer, P. Roth, and V. Lepetit. "Learning to Align Semantic Segmentation and 2.5D Maps for Geolocalization". In: *Proceedings of the Conference on Computer Vision and Pattern Recognition* (*CVPR*). 2017.

[3] C. Arth, C. Pirchheim, J. Ventura, D. Schmalstieg, and V. Lepetit. "Instant Outdoor Localization and SLAM Initialization from 2.5D Maps". In: *IEEE Transactions on Visualization and Computer Graphics*. 2016.

[4] A. Sironi, E. Türetken, V. Lepetit, and P. Fua. "Multiscale Centerline Detection". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*PAMI*) (2016).

[5] T. Trzcinski, C. M. Christoudias, and V. Lepetit. "Learning Image Descriptors with Boosting". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*PAMI*) (2015).

[6] M. Oberweger, P. Wohlhart, and V. Lepetit. "Training a Feedback Loop for Hand Pose Estimation". In: *Proceedings of the International Conference on Computer Vision* (*ICCV*). *Oral presentation*. 2015.

[7] A. Crivellaro, M. Rad, Y. Verdie, K. M. Yi, P. Fua, and V. Lepetit. "A Novel Representation of Parts for Accurate 3D Object Detection and Tracking in Monocular Images". In: *Proceedings of the International Conference on Computer Vision* (*ICCV*). 2015.

[8] S. Hinterstoisser, C. Cagniart, S. Ilic, P.F. Sturm, N. Navab, P. Fua, and V. Lepetit. "Gradient Response Maps for Real-Time Detection of Textureless Objects". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*PAMI*) (2012).

[9] M. Calonder, V. Lepetit, M. Ozuysal, T. Trzcinski, C. Strecha, and P. Fua. "BRIEF: Computing a Local Binary Descriptor Very Fast". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*PAMI*) (2012).