

EDUCATION

- 2015-20 **Ph.D. in Computer Science, *summa cum laude* – Universität Passau (Germany)**
- Company-based Ph.D. in Computer Vision and Machine Learning.
 - Topic: “Bridging the Realism Gap for CAD-based Visual Recognition” (simulation, domain adaptation, learning).
 - Member of IRIXYS (International Research and Innovation Centre in Intelligent Digital Systems).
 - Awards:
 - Outsanting Dissertation Award by the Faculty of Computer Science and Mathematics (University of Passau).
 - Best Dissertation Award 2021 by the French-German University (UFA-DFH).
- 2014 **Master's Degree in Computer Science, with Honors – Universität Passau (Germany)**
- French-German research-oriented Double Degree.
 - Multimedia, Visual Analytics & Distributed Systems.
 - Awards:
 - Excellence Award, by the Faculty of Computer Science and Mathematics (University of Passau).
 - Franco-German Award of Excellence, by the French-German University (UFA-DFH).
- 2010-14 **Master's Degree in Computer Science, with Honors – National Institute for Applied Sciences (INSA) of Lyon (France)**
- Programming techniques, Hardware, Networks & Designing methods.
 - Team, Project & Quality Management.
- 2013
1 semester **ERASMUS Exchange, Computer Science Master – Luleå Tekniska Universitet (Sweden)**
- Mobile Media, Distributed Systems, Web Services.
- 2008-10 **Undergraduate intensive course – INSA of Lyon (France)**
- Engineering sciences – Mathematics, Mechanics, Physics, Thermodynamics.
 - ASINSA – Department with emphasis on cultural and scientific connections with Asia.
- 2008 **Scientific Baccalaureate – Lycée Jeanne d'Arc (France)**
- Graduated with first-class honor & European Grad (English).

PROFESSIONAL EXPERIENCE

- 2021
(current) **Senior Research Scientist – Ull America, Inc. (Cambridge, MA, USA)**
- Develops novel solutions toward more accurate and automated medical scanning.
 - Focuses on scene understanding, human mesh regression, motion prediction, etc.
- dense visual prediction, scene understanding, mesh regression, differentiable rendering
- 2020-21
1 year
+ 10 months **Research Scientist – Siemens Technology (Princeton, NJ, USA)**
- Conducted research toward more robust vision systems, in a multinational context.
 - Specialized in the training of industrial systems on scarce visual data (images, CAD, etc.).
 - Investigated, applied to, and conducted governmental projects (MxD, USDA-ARS, etc.).
- inverse problems, domain adaptation, simulation, cad-based recognition, weak supervision
- 2015-19 **Ph.D. Researcher – Siemens Technology + Uni-Passau (Munich, Germany)**
- Explored new solutions for efficient sensor simulation and domain adaptation.
 - Introduced to large-scale industrial projects (consulting, prototyping).
 - Generated multiple patents, supervised students.
- computer vision, domain adaptation, simulation, cad-based recognition, image rendering,
- 2014
6 months **Master's Researcher – Siemens + Uni-Passau + INSA-Lyon (Passau, Germany)**
- Improved a stream processing architecture for Smart Grids.
 - Implemented simulation tools for performance assessment.
- physics, simulation, openpdc, c#, hadoop, tex
- 2012-13
1 year **Image Analysis Intern (gap year) – Mitsubishi Electric (Osaka, Japan)**
- Conceived solutions for multi-sensor data analytics.
 - Implemented applications for industrial robots.
- robot vision, simulation, opencv, robotics-studio, matlab, c#
- 2012
4 months **Java Developer Intern – Atos Worldline (Lyon, France)**
- Implemented components for large electronic payment flows (PCI-DSS).
 - Designed tasks to analyze financial flows and detect anomalies.
- java, spring, scrum
- 2011
3 months **Image Analysis Intern – LIRIS, Imagine team (Lyon, France)**
- Researched and implemented recognition algorithms for vegetal species.
 - Refined probabilistic comparison algorithms over image databases.
- stats, pca, c++, qt, opencv

2010-12	Academic Tutor – <i>Passerelle INSA Lyon</i> (Lyon, France) <ul style="list-style-type: none"> Prepared and taught science classes to undergraduate engineers (Math, Physics, etc.). 	teaching, math, physics, thermodynamics
2010 1 month	Teacher-volunteer – <i>RCDP</i> (Kathmandu, Nepal) <ul style="list-style-type: none"> Prepared and taught English classes to young Buddhist monks. 	personal development
2009 1 month	Intern – <i>Tajima Roofing</i> (Tokyo, Japan) <ul style="list-style-type: none"> Initiated to the Japanese business system and manufacturing work. 	personal development, japanese

PUBLICATIONS

• Conferences

2021	Planche B., Singh R.V. Physics-based Differentiable Depth Sensor Simulation. <i>In Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2021 (pp. 14387-14397).</i>	differentiable rendering, simulation, depth sensor,
2021	Akiva, P. ^{EQ} , Planche, B. ^{EQ} , Roy, A., Dana, K., Oudemans, P., & Mars, M. AI on the Bog: Monitoring and Evaluating Cranberry Crop Risk. <i>In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2021 (pp. 2493-2502) (EQ = equal contribution)</i>	semantic segmentation, visual flow, weak supervision, timeseries, precision agriculture
2019	Planche, B., Rong, X., Wu, Z., Karanam, S., Kosch, H., Tian, Y., Hutter, A. and Ernst, J., Incremental Scene Synthesis. <i>In Advances in Neural Information Processing Systems (NeurIPS), 2019 Annual Conference on.</i>	neural memory, novel view synthesis, scene understanding, slam
2019	Planche, B. ^{EQ} , Zakharov, S. ^{EQ} , Wu, Z., Hutter, A., Kosch, H. and Ilic, S., Seeing Beyond Appearance – Mapping Real Images into Geometrical Domains for Unsupervised CAD-based Recognition. <i>In Intelligent Robots and Systems (IROS), 2019 IEEE/RSJ International Conference on (pp. 552-559). IEEE. (EQ = equal contribution)</i>	domain adaptation, realism gap, multi-task autoencoder, distillation
2018	Zakharov, S. ^{EQ} , Planche, B. ^{EQ} , Wu, Z., Hutter, A., Kosch, H. and Ilic, S., Keep it Unreal: Bridging the Realism Gap for 2.5 D Recognition with Geometry Priors Only. <i>In 3D Vision (3DV), 2018 International Conference on (pp. 1-11). IEEE. (EQ = equal contribution)</i>	domain adaptation, realism gap, gan
2017	Planche, B., Wu, Z., Ma, K., Sun, S., Kluckner, S., Lehmann, O., Chen, T., Hutter, A., Zakharov, S., Kosch, H. and Ernst, J., Depthsynth: Real-time Realistic Synthetic Data Generation from CAD Models for 2.5D Recognition. <i>In 3D Vision (3DV), 2017 International Conference on (pp. 1-10). IEEE.</i>	simulation, depth sensor, 3D data, realism gap, noise study
2017	Zakharov, S., Kehl, W., Planche, B., Hutter, A. and Ilic, S., 3D object instance recognition and pose estimation using triplet loss with dynamic margin. <i>In Intelligent Robots and Systems (IROS), 2017 IEEE/RSJ International Conference on (pp. 552-559). IEEE.</i>	triplet network, classification, pose estimation, domain adaptation
2014	Planche, B., Malyn, B.I., Blanco, D.B. and Bermejo, M.C., The Brightest Web-Based Home Automation System. <i>In International Conference on Ubiquitous Computing and Ambient Intelligence (pp. 72-75). Springer, Cham.</i>	web of things, home automation, inference system

• Theses

2020	Planche, B., Bridging the Realism Gap for CAD-Based Visual Recognition. PhD thesis. <i>Advisors: Prof. Dr. Kosch, H., Dr. Hutter, A.</i>	domain adaptation, simulation
2014	Planche, B., PMU Data Processing for Smart Grids. Master's thesis. <i>Advisors: Prof. Dr. Kosch, H., Dr. Bäuse, G.</i>	smart grid, pmu, openpdc, hadoop, physics, simulation

• Book

2019	Planche, B. ^{EQ} , Andres, E. ^{EQ} , Hands-On Computer Vision with TensorFlow 2. (372 pages) <i>Packt Publishing Ltd. (EQ = equal contribution)</i>	tensorflow2, keras, python, ML theory, teaching
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• Preprint

2021	Planche, B., Singh R.V., Physics-based Differentiable Depth Sensor Simulation. arXiv preprint arXiv:2103.16563.	differentiable rendering, simulation, depth sensor
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• Patents

2021 (granted)	Planche, B., Wu, Z. Synthetic depth image generation from CAD data using generative adversarial neural networks for enhancement. <i>US-10901740.</i>	simulation, depth sensor, 3D data, gan
2021 (published)	Hutter A., Slobodan, I., Planche, B., Wu, Z., Zakharov, S., Mapping images to the synthetic domain. <i>US-17268675.</i>	depth data, 3D data, domain adaptation, multi-task

2021 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Hutter, A., Object recognition from images using CAD models as prior. <i>US-17045124</i> .	3D data, domain adaption, recognition
2020 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Segmenting and Denoising Depth Images for Recognition Applications Using Generative Adversarial Neural Networks. <i>US-16756530</i> .	simulation, depth sensor, 3D data, gan, domain adaption
2019 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Hutter, A., Mapping RGB Images to the Synthetic Depth Domain with 3D Models for Only Prior. <i>EP3611665</i> .	rgb data, 3D data, domain adaption, multi-task
2019 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Hutter, A., Improving CNN-based Object Recognition by Introducing CAD Priors. <i>WO2019192745</i> .	rgb data, 3D data, domain adaption, recognition
2019 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Hutter, A., Extensive and Modular Augmentation Pipeline for Deep-Learning Methods Trained on Synthetic Color Images. <i>WO2019192746</i> .	augmentation, domain randomization, training
2019 (published)	Planche, B., Zakharov, S., Wu, Z., Slobodan, I., Hutter, A., Deep Learning-based Recovery of Objects Geometry from Color Images using CAD as prior. <i>WO2019192744</i> .	rgb data, 3D data, domain adaption, multi-task
2018 (published)	Wu, Z., Ma, K., Planche, B., Sun, S., Singh, V.K., Kluckner, S., Chen, T., Ernst, J., Real-time generation of synthetic data from structured light sensors for 3d object pose estimation. <i>WO2018080533A1</i> .	simulation, depth sensor, 3D data
2018 (published)	Wu, Z., Ma, K., Planche, B., Sun, S., Singh, V.K., Kluckner, S., Chen, T., Ernst, J., Real-time generation of synthetic data from multi-shot structured light sensors for 3d object pose estimation. <i>WO2018156126A1</i> .	simulation, depth sensor, 3D data

LANGUAGES

French:	Mother tongue
English:	Fluent – Advanced classes, years spent abroad – TOEIC : 990 out of 990
German, Japanese:	Good skills, both written and oral
Chinese, Swedish:	Basic knowledge

ACTIVITIES

Reviewer:

- IEEE/CVF Conference on Computer Vision and Pattern Recognition
- European Conference on Computer Vision
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Computer Vision and Image Understanding
- IEEE Access Journal

StackOverflow member (username: [benjaminplanche](#), reputation > 12k):

- Among top 15 answerers for: *pytorch*
- Among top 1% answerers for: *tensorflow*
- Among top 5% answerers for: *conv-neural-network, dataset, deep-learning, keras, python, python-3.x, tensor*
- Among top 10% answerers for: *3d, image-processing, loss-function, machine-learning, neural-network, projection, reshape*

Developer of web systems and demos (github.com/benjaminplanche):

- **Pointillism + Morphose** – 1KB visual demo, custom 3D engine & procedural generation (*awarded at JS1K 2013*).
- **Notepal + 3Dpal** – Collaborative editing websites.
- **Rithm + Brightnest + Cozy-Nest** – Home automation systems.
- **AEDI S.I.** – Website of the student association of INSA-Lyon Faculty of Computer Science.

Amateur photographer:

- Events (concerts, weddings), Travels, Landscapes.

References available upon request.