Thanh-An Pham
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thanhanpham.github.io

Vita

2017 - *curr*	Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland PhD student at the Biomedical Imaging Group (BIG) *Project*: Nonlinear inverse problems in optics *(working title)* *Advisors*: Prof. Michael Unser and Dr. Emmanuel Soubies
2018	Université de Lausanne (UNIL), Switzerland Civil service at Prof. Andrea Volterra's group *Project*: Data analysis of astrocyte-associated calcium imaging *Advisors*: Prof. Andrea Volterra
2016-2017	Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland Civil service at the Laboratory of Geographic Information Systems (LASIG) *Project*: Soundscape and health indicators *Advisors*: Prof. François Golay
2015 - 2016	University of Iowa, USA Master Project at the Computational Biomedical Imaging Group (CBIG) *Project*: Reconstruction of subcellular structure using super-resolution localization microscopy *Advisors*: Prof. Mathews Jacob and Prof. Michael Unser
2013 - 2016	Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland **MSc in Bioengineering** with Minor in **Neuroprosthetics**
2015	Advanced Digital Science Center (ADSC), Singapore Industry intern *Project*: Monitoring mental fatigue with EEG signals *Advisors*: Babu Ramachandran
2010 - 2013	Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland **BSc in Life Sciences and Technologies**

Research Interests

Computational imaging	Inverse problems in imaging *Physical model: wave propagation, optics* *Regularization-based reconstruction algorithms*
Machine learning	Deep learning for image reconstruction *Supervised and unsupervised learning, untrained neural networks*

Publications

Journal:

1. T. Hong*, **T.-a. Pham***, E. Treister, and M. Unser, "Diffraction tomography with Helmholtz equation: Efficient and robust multigrid based solver," 2021, under review

2. **T.-a. Pham**, E. Soubies, F. Soulez, and M. Unser, "Optical diffraction tomography from single-molecule localization microscopy," 2021, under review

3. F. Yang, **T.-a. Pham**, N. Brandenberg, M. P. Lutolf, J. Ma, and M. Unser, "Robust phase unwrapping via deep image prior for quantitative phase imaging," 2020, under review. [*Link: https://arxiv.org/abs/2009.11554*]

4. J. Griffie, **T.-a. Pham**, C. Sieben, R. Lang, V. Cevher, S. Holden, M. Unser, S. Manley, and D. Sage, "Virtual-SMLM, a virtual environment for real-time interactive SMLM acquisition," 2020, under review. [*Link: https://www.biorxiv.org/content/10.1101/2020.03.05.967893v1*]

5. F. Yang, **T.-a. Pham**, H. Gupta, M. Unser, and J. Ma, "Deep-learning projector for optical diffraction tomography," *Optics Express*, vol. 28, no. 3, pp. 3905–3921, February 3, 2020

6. A. Ayoub, **T.-a. Pham**, J. Lim, M. Unser, and D. Psaltis, "A method for assessing the fidelity of optical diffraction tomography reconstruction methods using structured illumination," *Optics Communications*, vol. 454, no. 124486, pp. 1–6, January 1, 2020

7. **T.-a. Pham**, E. Soubies, A. Ayoub, J. Lim, D. Psaltis, and M. Unser, "Three-dimensional optical diffraction tomography with Lippmann-Schwinger model," *IEEE Transactions on Computational Imaging*, vol. 6, pp. 727–738, 2020

8. E. Soubies, F. Soulez, M. McCann, **T.-a. Pham**, L. Donati, T. Debarre, D. Sage, and M. Unser, "Pocket guide to solve inverse problems with GlobalBioIm," *Inverse Problems*, vol. 35, no. 10, pp. 1–20, October 2019, paper no. 104006

9. D. Sage*, **T.-a. Pham***, H. Babcock, T. Lukes, T. Pengo, J. Chao, R. Velmurugan, A. Herbert, A. Agrawal, S. Colabrese, A. Wheeler, A. Archetti, B. Rieger, R. Ober, G. Hagen, J.-B. Sibarita, J. Ries, R. Henriques, M. Unser, and S. Holden*, "Super-resolution fight club: Assessment of 2D and 3D single-molecule localization microscopy software," *Nature Methods—Techniques for Life Scientists and Chemists*, vol. 16, no. 5, pp. 387–395, May 2019

10. **T.-a. Pham**, E. Soubies, A. Goy, J. Lim, F. Soulez, D. Psaltis, and M. Unser, "Versatile reconstruction framework for diffraction tomography with intensity measurements and multiple scattering," *Optics Express*, vol. 26, no. 3, pp. 2749–2763, February 5, 2018

11. E. Soubies*, **T.-a. Pham***, and M. Unser, "Efficient inversion of multiple-scattering model for optical diffraction tomography," *Optics Express*, vol. 25, no. 8, pp. 21 786–21 800, September 4, 2017

*: Equal contributions

Conference, symposium and workshops:

1. **T.-a. Pham**, E. Soubies, F. Soulez, and M. Unser, "Diffraction tomography from single-molecule localization microscopy: Numerical feasibility," in *Proceedings of the Eighteenth IEEE International Symposium on Biomedical Imaging (ISBI'21)*, Nice, French Republic, April 13-16, 2021, pp. 854–857, **Best student paper award**

2. Q. Denoyelle, **T.-a. Pham**, P. del Aguila Pla, D. Sage, and M. Unser, "Optimal-transport-based metric for SMLM," in *Proceedings of the Eighteenth IEEE International Symposium on Biomedical Imaging (ISBI'21)*, Nice, French Republic, April 13-16, 2021, pp. 797–801

3. **T.-a. Pham**, E. Soubies, A. Ayoub, D. Psaltis, and M. Unser, "Adaptive regularization for three-dimensional optical diffraction tomography," in *Proceedings of the Seventeenth IEEE International Symposium on Biomedical Imaging (ISBI'20)*, Iowa City IA, USA, April 5-7, 2020, pp. 182–186, [nominated for best paper award]

4. **T.-a. Pham**, E. Soubies, D. Sage, and M. Unser, "Closed-form expression of the Fourier ring-correlation for single-molecule localization microscopy," in *Proceedings of the Sixteenth IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI'19)*, Venice, Italian Republic, April 8-11, 2019, pp. 321–324, **Best student paper award**

5. **T.-a. Pham**, E. Soubies, J. Lim, A. Goy, F. Soulez, D. Psaltis, and M. Unser, "Phaseless diffraction tomography with regularized beam propagation," in *Proceedings of the Fifteenth IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI'18)*, Washington DC, USA, April 4-7, 2018, pp. 1268–1271

6. L. Donati, E. Soubies, **T.-a. Pham**, and M. Unser, "User-friendly building of reconstruction algorithms for solving inverse problems," in *Proceedings of the Seventeenth IEEE International Symposium on Biomedical Imaging (ISBI'20)*, Iowa City IA, USA, April 5-7, 2020, p. 1307

7. **T.-a. Pham**, N. Brandenberg, S. Hoenel, B. Rappaz, M. Unser, M. Lütolf, and D. Sage, "Quantitative image-analysis of organoids with high-throughput digital holography microscopy," in *Proceedings of the 2020 Quantitative BioImaging Conference (QBI'20)*, Oxford, United Kingdom, January 6-9, 2020, paper no. 365

8. D. Sage, **T.-a. Pham**, and M. Unser, "3D single molecule localization microscopy: Key outcomes of the software benchmarking," in *Proceedings of the Sixteenth IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI'19)*, Venice, Italian Republic, April 8-11, 2019, p. 610

9. **T.-a. Pham**, D. Sage, and S. Holden, "Developments of the ongoing 3D SMLM software challenge," in *Seventh Single Molecule Localization Microscopy Symposium (SMLMS'17)*, London, United Kingdom, August 30-September 1, 2017

Awards

2021	**Best student paper** ISBI (2nd prize)
2019	**Best student paper** ISBI (runner-up)

Review activities

Optica

Optics Express

Journal of the Optical Society of America A

Optics Letters

Transactions on Computational Imaging

Transactions on Microwave Theory and Techniques

Nature Methods

Nature Communications

International Symposium on Biomedical Imaging (ISBI)

Teaching

2017 - *Curr* Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Teaching assistant for Image Processing I and II (> 200 students)
Head teaching assistant (2017-2020)

2012 - 2015 Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Teaching assistant (student)
Physics I, II and Analysis I, II & IV for Life Science and Technologies section (SV).

Supervised students:

2021 Paul Margain
Internship: High-resolution reconstruction in single-particle cryo-EM with a multi-scale joint refinement scheme

2021 Mickael Gindroz
Semester project: Differentiable Approximation of Hessian-Schatten Regularization for Image Reconstruction

2021 Aiday Marlen
Semester project: Using regularization to reduce the number of projection angles in optical projection tomography

2020 Paul Margain
Semester project: Deep learning for 3D particle field imaging

2020 Louis-Nicolas Douce
Semester project: Slice-based Dictionary Learning for Computed Tomography

2020 Mohamed Bahroun
Semester project: Image reconstruction for optical diffraction tomography

2019 Jérome Savary
Semester project: Phase Unwrapping with Deep Learning

2019 Elias Gajo
Semester project: An off-the-grid algorithm in ImageJ for 3D single-molecule localization microscopy (bis)

2019 Amandine Evard
Semester project: An off-the-grid algorithm in ImageJ for 3D single-molecule localization microscopy

2019 Luca Fetz
Semester project: Timing correction for slow-scanning biomedical imaging devices

2019 Clélie De Witasse
Semester project: Dictionary Learning for Limited Angle Computed Tomography

2018 Cédric Schumacher
Semester project: Improving depth-of-field by deconvolution

Languages

French	: Native
English	: Fluent
German	: B2 level

Personal

I play piano (somewhat guitar), love music improvisation (at my own level)
Occasional reader/watcher of science-fiction books/movie
Willing to try new food cuisines
Biking and soccer (under mild conditions)