

Thanh-An Pham
Email: thanh-an.pham@epfl.ch
Swiss citizen



VITA

- 2017 - *curr* Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
PhD student at the Biomedical Imaging Group (BIG)
Project (working title): Nonlinear inverse problem in optics
Advisors: Dr. Emmanuel Soubies and Prof. Michael Unser
- 2015 - 2016 University of Iowa in Iowa City, Iowa, USA
Master Project in Prof. Jacob group
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), Lausanne, Switzerland
MSc in Bioengineering with Minor in **Neuroprosthetics**
- 2015 Advanced Digital Science Center (ADSC), Singapore
Industry intern
- 2010 - 2013 Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
BSc in Life Sciences and Technologies

RESEARCH INTEREST

- Computational imaging** Inverse problem for imaging problems
Physical model: wave propagation, optics
Regularization: deterministic, learnt
Reconstruction algorithms
Joint optimization
- Machine learning** Deep learning for image reconstructions
Supervised, unsupervised, untrained

PUBLICATIONS

Journal:

1. T. Hong*, **Pham T.-a.***, E. Treister, and M. Unser, “Diffraction tomography with Helmholtz equation: Efficient and robust multigrid based solver,” 2021, under review
2. **Pham T.-a.**, E. Soubies, F. Soulez, and M. Unser, “Optical diffraction tomography from single-molecule localization microscopy,” 2021, under review
3. F. Yang, **Pham T.-a.**, N. Brandenburg, 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, **Pham T.-a.**, 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, **Pham T.-a.**, 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, **Pham T.-a.**, 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. **Pham T.-a.**, 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, **Pham T.-a.**, 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*, **Pham T.-a.***, 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. **Pham T.-a.**, 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*, **Pham T.-a.***, 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. **Pham T.-a.**, 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, **Pham T.-a.**, 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. **Pham T.-a.**, 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. **Pham T.-a.**, 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. **Pham T.-a.**, 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, **Pham T.-a.**, 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. **Pham T.-a.**, N. Brandenburg, 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, **Pham T.-a.**, 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. **Pham T.-a.**, 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 award (2nd prize)
2019	Best student paper ISBI award (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

TEACHING

2017 - <i>Curr</i>	Swiss Federal Institute of Technology in Lausanne (EPFL), Lausanne Teaching assistant for image processing I and II Head teaching assistant (2017-2020)
2012 - 2015	Swiss Federal Institute of Technology in Lausanne (EPFL), Lausanne Teaching assistant (student) Physics I, II and Analysis I, II & IV for Life Science and Technologies section (SV).

Supervised students:

2021	Paul Margain <i>Internship:</i> High-resolution reconstruction in single-particle cryo-EM with a multi-scale joint refinement scheme
2021	Mickael Gindroz <i>Semester project:</i> 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 Jérôme 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
 Open to try any new food culture
 Biking and soccer (under mild conditions)