

Gabrielle Flood, Ph.D.

CONTACT INFORMATION	Domherrevägen 3G 227 29, Lund, Sweden	+46738442044 gabrielleflood.gf@gmail.com
CURRENT POSITION	Postdoctoral Researcher Division of Computer Vision and Machine Learning, Centre for Mathematical Sciences Lund University, Lund, Sverige - Position includes 80% research activities and 20% teaching - My main research interests concern mathematical methods for computer vision. I am currently working on geometry-related computer vision problems – for images as well as audio and radio data – and different types of medical image analysis.	Feb 2022–present
EDUCATION AND EXPERIENCE	Ph.D. in Applied Mathematics Centre for Mathematical Sciences, Lund University, Lund, Sweden - Doctoral Thesis: <i>Mapping and Merging Using Sound and Vision – Automatic Calibration and Map Fusion with Statistical Deformations</i> , (Dec 2019). - Licentiate Thesis: <i>Towards Precise Localisation – Subsample Methods, Efficient Estimation and Merging of Maps</i> , (Dec 2019). - Main Advisor: Prof. Kalle Åström - Assistant Advisors: Prof. Anders Heyden, Prof. Carl Olsson M.Sc. in Engineering Mathematics Lund University, Lund, Sweden - Masters in Applied Mathematics for Image Analysis and Biological and Medical Modelling - Masters Thesis: <i>Deep Learning with a DAG Structure for Segmentation and Classification of Prostate Cancer</i> - Supervisor: Prof. Kalle Åström Substitute Teacher Municipality of Grästorp, Grästorp, Sweden - Substitute teacher in elementary school (Swedish grundskola, children aged 6-15 years) in all different subjects.	Oct 2016–Dec 2021 2011–Aug 2016 2010–2011
REFEREED PUBLICATIONS	1. Flood, G., Elvander, F., “Multi Source Localization and Data Association for Time-Difference of Arrival Measurements”. In <i>European Signal Processing Conference (EUSIPCO)</i>, Lyon, France. (2024) 2. Gillsjö, D., Flood, G., Åström, K., “Semantic Room Wireframe Detection from a Single View”. In <i>IEEE/CVF International Conference on Computer Vision (ICCV) Workshops</i>, Paris, France. (2023) 3. Andersson, M., Nilsson, M., Flood, G., Åström, K., “Augmentation Strategies for Self-Supervised Representation Learning from Electrocardiograms”. In <i>European Signal Processing Conference (EUSIPCO)</i>, Helsinki, Finland. (2023) 4. Tegler, E., Engman, J., Gillsjö, D., Flood, G., Larsson, V., Oskarsson, M., Åström, K., “The Multi-View Geometry of Parallel Cylinders”. In <i>Scandinavian Conference in Image Analysis (SCIA)</i>, Levi, Finland. (2023) 5. Flood, G., Tegler, E., Gillsjö, D., Heyden, A., Åström, K., “Minimal Solvers for Point Cloud Matching with Statistical Deformations”. In <i>International Conference in Pattern Recognition (ICPR)</i>, Montreal, Canada. (2022) 6. Gillsjö, D., Flood, G., Åström, K., “Semantic Room Wireframe Detection from a Single View”. In <i>International Conference in Pattern Recognition (ICPR)</i>, Montreal, Canada. (2022)	

7. Åström, K., Larsson, M., **Flood, G.**, Oskarsson, M., “Extension of Time-Difference-of-Arrival Self Calibration Solutions Using Robust Multilateration”. In *European Signal Processing Conference (EUSIPCO)*, Virtual. (2021)
 8. Larsson, M., **Flood, G.**, Oskarsson, M., Åström, K., “Fast and Robust Stratified Self-Calibration Using Time-Difference-of-Arrival Measurements”. In *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Virtual. (2021)
 9. **Flood, G.**, Gillsjö, D., Persson, P., Heyden, A., Åström, K., “Generic Merging of Structure from Motion Maps with a Low Memory Footprint”. In *International Conference in Pattern Recognition (ICPR)*, Virtual. (2020)
 10. Larsson, M., **Flood, G.**, Oskarsson, M., Åström, K., “Upgrade Methods for Stratified Sensor Network Self-Calibration”. In *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Virtual. (2020)
 11. **Flood, G.**, Gillsjö, D., Heyden, A., Åström, K., “Efficient Merging of Maps and Detection of Changes”. In *Scandinavian Conference in Image Analysis (SCIA)*, Norrköping, Sweden. (2019)
 12. Batstone, K., **Flood, G.**, Beleyur, T., Larsson, V., Goerlitz, H. R., Oskarsson, M., Åström, K., “Robust Self-Calibration of Constant Offset Time-Difference-of-Arrival”. In *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brighton, United Kingdom. (2019)
 13. **Flood, G.**, Heyden, A., Åström, K., “Stochastic Analysis of Time-Difference and Doppler Estimates for Audio Signals”. In *Lecture Notes in Computer Science: Pattern Recognition Applications and Methods (LNCS)*. (2019)
 14. **Flood, G.**, Heyden, A., Åström, K., “Estimating Uncertainty in Time-difference and Doppler Estimates”. In *International Conference on Pattern Recognition Applications and Methods (ICPRAM)*, Funchal, Portugal (2018)
- The paper was nominated for best student paper award.

CONFERENCE
PRESENTATIONS

- Oral presentation of the paper “Multi Source Localization and Data Association for Time-Difference of Arrival Measurements”. at the European Signal Processing Conference (EUSIPCO) Lyon, France (2024).
- Oral presentation themed “Minimal Solvers for Point Cloud Matching with Statistical Deformations and Some Multi-view Geometry for Parallel Cylinders” at the ELLIS Algebraic Vision and Machine Learning Workshop in Prague, Czechia (2024).
- Oral presentation of the paper “Augmentation Strategies for Self-Supervised Representation Learning from Electrocardiograms”. at the European Signal Processing Conference (EUSIPCO) Helsinki, Finland (2023).
- Poster presentation of the paper “Minimal Solvers for Point Cloud Matching with Statistical Deformations” at the International Conference in Pattern Recognition (ICPR), Montreal, Canada (2022).
- Virtual poster presentation and 6 minutes oral spotlight presentation (pre-recorded) of the paper “Generic Merging of Structure from Motion Maps with a Low Memory Footprint” at the International Conference in Pattern Recognition (ICPR), Virtual (2020).
- Poster presentation of the paper “Efficient Merging of Maps and Detection of Changes” at the Scandinavian Conference in Image Analysis (SCIA), Norrköping, Sweden (2019).
- Oral presentation of the paper “Estimating Uncertainty in Time-difference and Doppler Estimates” at the International Conference on Pattern Recognition Applications and Methods (ICPRAM), Funchal, Portugal (2018).
- Oral presentation at the Swedish Symposium of Image Analysis (SSBA), Stockholm, Sweden (2018).

OTHER RESEARCH AND POPULAR SCIENTIFIC PRESENTATIONS	- Took part in the interdisciplinary conference “AI* Nordic Powwow 2023”, Lund, Sweden, with a poster presentation and as a representative for the network “AI Lund”. Title: <i>Generic Fusion of Point Cloud Maps with Statistical Deformations</i>. (May 2023). - Invited to give a presentation for a Machine Learning Group and a Computer Vision Group at Aalto University, Finland. Title: <i>Matching and Merging of Structure from Motion Maps with Statistical Deformations</i>. (April 2023) - Invited to give a presentation in RISE (Research Institutes of Sweden) seminar series “Learning Machines”. The presentation was virtual and directed towards both industry and academia. Title: <i>Matching and Merging of Structure from Motion Maps with Statistical Deformations</i>. (March 2023) - Invited to give a popular scientific presentation for bachelor- and masters students as well as researchers, as a part of the exhibition “Remember Maryam Mirzakhani”, at The Centre for Mathematical Sciences, Lund University. Title: <i>Becoming your own avatar – How to do a 3D reconstruction from images</i>. (May 2019)
TEACHING EXPERIENCE	Co-/guest/substitute lecturer in: 2023–present - Machine learning - Computer vision (model fitting) - One variable calculus Teaching assistant in: 2012–13, 2016–present - Bachelor courses in mathematics: calculus in one variable; calculus in several variables; linear algebra. - Bachelor programming courses: Matlab introduction; scientific programming in Matlab. - Bachelor and Master project courses: mathematical modelling; project course in applied mathematics. - Master courses: image analysis; medical image analysis; computer vision; machine learning. Project/thesis supervision: 2016–present - Co-supervisor for five Master’s theses about gunshot detection using time-of-arrival; nutrition estimation from food images; minimal solvers for loop closure; augmentation for self-supervised learning in ECG signals; and image retrieval using graph neural networks. - Main supervisor for three Master’s theses about machine learning assisted positioning using cell fingerprinting; deep learning to enhance resolution of MR images; and semantic analysis of indoor floor plans. Ph.D. supervision: 2022–2023 - Co-supervisor for David Gillsjö, who defended in June 2023 with the thesis “Applications in Monocular Computer Vision using Geometry and Learning: Map Merging, 3D Reconstruction and Detection of Geometric Primitives”.
REVIEWING	I have been a reviewer at several conferences and related workshops, e.g. ICCV 2024, ICPR 2024, ICCV 2023, ICCV 2021, ECCV 2020, CVPR 2018 and ICPR 2018. I have also been a reviewer for EURASIP Journal on Audio, Speech, and Music Processing (JASM).
EXTRACURRI- CULAR ACTIVITY	- Session chair at the European Signal Processing Conference (EUSIPCO) Helsinki, Finland, 2023. - Part of the organising committee of the Swedish Symposia on Deep Learning and Image Analysis in 2020 (cancelled last minute) and 2021 (virtual) with focus on venues and social activities.

- PhD representative in the Board for the Centre for Mathematical Sciences, Lund University (2019-2021).
- Student representative in the Board of Education for Engineering Mathematics, Lund University (2013-2016).
- Volunteer worker at the Student Union at the Faculty of Engineering at Lund University.

RESEARCH GRANTS

- The Fund of the Walter Gyllenberg Foundation from the Royal Physiographic Society of Lund, 2023 (100,000 SEK).

SOFTWARE SKILLS

Very good: Matlab
Good: Python Intermediate: Java, C, C++