

## Curriculum vitae — Professor Dr. Mats I. Pettersson

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Date and place of Birth: April 22, 1966, Karlskrona, Sweden

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### 1. Doctoral degree

Degree:	<i>Ph.D.</i>
Subject Area:	Signal Processing
University:	Chalmers University of Technology, Gothenburg, Sweden
Year:	2000
Title:	Contribution to Wideband SAR Space-Time Processing, and Radar Remote Sensing of Sea Ice
Degree:	<i>Licentiate of Engineering</i>
Subject Area:	Radio and Space Science
University:	Chalmers University of Technology, Gothenburg, Sweden
Year:	1995
Title:	Microwave Remote Sensing of Arctic Sea Ice during Freeze-up using Radar and Passive Radiometry

### 2. Higher education degree

Degree:	<i>M.Sc. Engineering Physics</i>
University:	Chalmers University of Technology, Gothenburg, Sweden
Year:	1993

### 3. Present position

Title:	<i>Full Professor (2011-)</i>
Year:	2005-
Placement:	Department of Mathematics and Natural Science, Blekinge Institute of Technology, Karlskrona, Sweden

#### 4. Academic and project responsibilities

- 2012- *Research director* for RSG group  
2015- *Special Visiting Researcher - PVE* at Instituto Tecnológico de Aeronáutica (ITA) Brazil  
2016- *Project leader* at BTH for the external research project “Tentacle”  
2015- *Project leader* at BTH for the external research project “Radio Occultation Inversion Methods”  
2015-2018 *Project leader* at BTH for the external research project “Novel image inversion algorithms based on Doppler measurement for security and climate monitoring”

#### 5. Previous positions

##### **Blekinge Institute of Technology (BTH)**

- 2016-2018 *Member* at Board of Governors, BTH (3 years)  
2011-2013 *Member* at BTH education board (3 years)  
2011-2014 *Vice chairman* at BTH academic appointments board (3 years)  
2010-2011 *Research director* at School of Engineering, BTH (2 years)  
2006-2016 *Project leader* for various research projects

##### **Swedish Defence Research Establishment (FOI)**

- 1998-2007 *Researcher and First researcher*  
Dept. of Surveillance Radar, Div. of Sensor Technology, Swedish Defence Research Agency  
Linköping, Sweden  
2001-2007 *Project leader* for two big FOI projects, Div. of Sensor Technology, Swedish Defence Research Agency  
Linköping, Sweden

##### **Ericsson**

- 1996-1997 *Patent Project Manager (almost 2 years)*  
Ericsson Mobile Communication AB  
Lund, Sweden

##### **Chalmers University of Technology**

- 1993-1995 *Ph.D. Student*  
Radio and Space Science  
School of Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden

## 6. Active PhD students and individuals who have completed their doctoral degree or postdoctoral period under my supervision

Active PhD students with me as supervisor:

Name:	Thomas Sievert	Year:	2016
Name:	Saleh Javadi	Year:	2016
Name:	Vinícius Ludwig Barbosa	Year:	2016
Name:	Thomas Pernstål	Year:	2017
Name:	Muhammad Rameez	Year:	2017

Individuals who completed their doctoral degree under my supervision:

Name:	Svante Björklund	Year:	2017
Name:	T.K. Sjögren	Year:	2012
Name:	Imran Iqbal	Year:	2012
Name:	Vu Viet	Year:	2011
Name:	Eric Östlin	Year:	2009
Name:	Viktoria Tegborg <sup>1</sup>	Year:	2008

Individuals who had postdoctoral period under my supervision:

Name:	Natanael Rodrigues Gomes	Year:	2016-2017
Name:	Vu Viet	Year:	2012-2016
Name:	Renato Machado	Year:	2013-2015

Visiting PhD Students who did one year under my supervision

Name:	Bruna Gregory Palm	Year:	2018-2019
Name:	Dimas Irion Alves	Year:	2018-2019

## 7. Short Biografi

Mats Pettersson have worked almost 25 years in the field of radar technologies. Mainly he has worked with radar remote sensing and Synthetic Aperture Radar (SAR) signal processing at BTH, FOI and Chalmers. In particular he had worked with algorithm development for SAR processing, detection, estimation, focusing of moving targets, change detection and array processing. He also has experience in electromagnetic scattering, radio communication and in the latest years he has started research in the field of automotive radar and radio occultation of the atmosphere and ionosphere.

## 8. Experience of industrial and international research collaboration

Mats has during the years at FOI and BTH been an active project leader. At moment, he is the project leader of two external projects. He has been the main project leader/applicant for totally 13 research projects with approximate *80 million SEK* in external funding. Almost all those projects have been in close collaboration with industry. Therefore, Mats has a long experience of national and international research collaboration. At this moment, the main national collaborators are RUAG Space, Saab, Safe Radar, Swedish Transport Administration, Swedish Transport Agency and FOI. Internationally he is collaborating with *ITA*, Brazil, *Airbus Defence and Space*, Germany, *Alberta University*, Canada and “Forschungszentrum der Bundesrepublik Deutschland für Luft- und Raumfahrt” (*DLR*), Germany. In the past, his research groups has been collaborating with e.g. *NASA*, USA, *DERA*, UK, *Air Force Research Laboratory (AFRL)*, USA, *DARPA*, USA, *Office National d'Études et de Recherches Aérospatiales (ONERA)*, France, *ESA*, European

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<sup>1</sup> Licentiate degree

## Publication list Professor Mats I. Pettersson

### 1. Peer-reviewed articles

B.G. Palm; F.M. Bayer; R.J. Cintra ; M.I. Pettersson; R. Machado, "Rayleigh Regression Model for Ground Type Detection in SAR Imagery", **IEEE Geoscience and Remote Sensing Letter**, Available on early access, 2019

N.R. Gomes, P. Dammert, M.I. Pettersson, V.T. Vu, H. Hellsten, "Comparison of the Rayleigh and K-Distributions for Application in Incoherent Change Detection", **IEEE Geoscience and Remote Sensing Letter**, Vol 16, Issue 5, pp. 756-760, 2019

S. Javadi, M. Dahl, M.I. Pettersson, "Vehicle speed measurement model for video-based systems", **Computers and Electrical Engineering**, Vol 76, pp. 238-248, 2019

V.T Vu, N.R. Gomes, M.I. Pettersson, P. Dammert, H. Hellsten, "Bivariate Gamma Distribution for Wavelength-resolution SAR Change Detection", **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 57, Issue 1, 2019

V.T. Vu, M.I. Pettersson, P. Dammert, H. Hellsten "Two-Dimensional Data Conversion for One-Dimensional Adaptive Noise Canceler in Low-Frequency SAR Change Detection", **IEEE Transactions on Aerospace and Electronic Systems**, Vol. 54, Issue 5, 2018

V.T. Vu, M.I. Pettersson, "Derivation of Bistatic SAR Resolution Equations Based on Backprojection", **IEEE Geoscience and Remote Sensing Letter**, Vol. 15, Issue 5, pp. 694-698, 2018

T. Sievert, J. Rasch, A. Carlström and M.I. Pettersson, "Detection of reflections in GNSS radio occultation measurements using phase matching", **Atmospheric Measurement Techniques**, <https://doi.org/10.5194/amt-2017-216>, 2018

V.T. Vu, Mats I. Pettersson, Thomas K. Sjögren, "Moving Target Focusing in SAR Image With Known Normalized Relative Speed", **IEEE Transactions on Aerospace and Electronic Systems**, Vol. 53, No. 2, pp. 854-861, 2017

V.T. Vu, M.I. Pettersson, R. Machado, P. Dammert, H. Hellsten, "False Alarm Reduction in Wavelength-Resolution SAR Change Detection Using Adaptive Noise Canceler", **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 55, No. 1, pp. 591-599, 2017

R. Machado, V.T. Vu, M.I. Pettersson, P. Dammert, H. Hellsten, "The Stability of UWB Low-Frequency SAR Images", **IEEE Geoscience and Remote Sensing Letter**, Vol. 13, No. 8, pp. 1114-1118, 2016

S. Björklund, P. Grahm, A. Nelander and M.I. Pettersson, "Measurement of Rank and Other Properties of Direct and Scattered Signals", **International Journal of Antennas and Propagation**, Article ID 5483547, Vol. 2016, 2016

V.T. Vu, M.I. Pettersson, "Fast Backprojection Algorithms Based on Subapertures and Local Polar Coordinates for General Bistatic Airborne SAR Systems", **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 54, No. 5, pp. 2706-2712, 2016

M.I. Pettersson, T.K. Sjögren, V.T. Vu, "Performance of Moving Target Parameter Estimation Using SAR", **IEEE Transactions on Aerospace and Electronics Systems**, Vol. 51, No. 2, 2015

D. Oloumi, M.I. Pettersson, M.I., P. Mousavi, K. Rambabu, "Imaging of Oil-Well Perforations Using UWB Synthetic Aperture Radar", **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 53, No. 8, pp. 4510-4520, 2015

V.T. Vu, M.I. Pettersson, "Nyquist Sampling Requirements for Polar Grids in Bistatic Time-Domain Algorithms", **IEEE Transactions on Signal Processing**, Vol 63, No. 2, pp. 457-465, 2015

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Two-Dimensional Spectrum for BiSAR Derivation Based on Lagrange Inversion Theorem", **IEEE Geoscience and Remote Sensing Letter**, Vol. 11, No. 7, 2014

T. K. Sjögren, V. T. Vu, M. I. Pettersson, F. Wang, A. Gustavsson, D. Murdin and L.M.H. Ulander, "Suppression of Clutter in Multichannel SAR GMTI" **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 52, No 7, 2014

D. Oloumi, P. Mousavi, M.I. Pettersson and D. Elliott, "A Modified TEM Horn Antenna Customized for Oil Well Monitoring Applications", **IEEE Transaction on Antennas and Propagation**, Vol. 61, No. 12, pp. 5902 – 5909, 2013

S. Björklund, A. Nelander and M.I. Pettersson, "Auxiliary beam terrain-scattered interference suppression: reflection system and radar performance", **IET Radar, Sonar and Navigation**, Volume 7, No. 3, pp. 836-847, 2013

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Fast time-domain algorithms for UWB bistatic SAR processing," **IEEE Transactions on Aerospace and Electronics Systems**, vol. 49, no. 3, pp. 1982-1994, 2013

V. T. Vu, T. K. Sjögren and M. I. Pettersson, "Phase Error Calculation for Fast Time-Domain Bistatic SAR Algorithms", **IEEE Transactions on Aerospace and Electronics Systems**, vol. 49, no. 1, pp. 631–639, 2013

V. T. Vu, T. K. Sjögren and M. I. Pettersson, "On Synthetic Aperture Radar Azimuth and Range Resolution Equations", **IEEE Transactions on Aerospace and Electronics Systems**, vol. 48, no. 2, pp. 78–83, 2012.

T.K. Sjögren, V.T. Vu, M.I. Pettersson, A. Gustavsson, L.M.H. Ulander, "Moving Target Speed Estimation and Refocusing in SAR images", **IEEE Transactions on Aerospace and Electronics Systems**, vol. 48, no. 3, pp. 2426–2436, 2012.

V. Tegborg, M.I. Pettersson, I. Claesson, "Experimental results of passive imaging of moving continuous broadband sound sources within a sensor field", **IEEE Journal of Oceanic Engineering**, vol. 36, no. 1, pp. 26-37, 2011

V. T. Vu, T. K. Sjögren, M. I. Pettersson, and H. Hellsten, "An impulse response function for evaluation of ultra-wideband SAR imaging," **IEEE Transactions on Signal Processing**, vol. 58, no. 7, pp. 3927-3932, 2010.

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Ultra-wideband chirp scaling algorithm," **IEEE Geoscience and Remote Sensing Letter**, vol. 7, no. 2, pp. 281-285, 2010.

V. T. Vu, T. K. Sjögren, M. I. Pettersson, L. Håkansson, A. Gustavsson, and L. M. H. Ulander, "RFI suppression in ultrawideband SAR using an adaptive line enhancer," **IEEE Geoscience and Remote Sensing Letter**, vol. 7, no. 4, pp. 694-698, 2010.

V. T. Vu, T. K. Sjögren, M. I. Pettersson, A. Gustavsson, and L. M. H. Ulander, "Detection of moving targets by focusing in UWB SAR Theory and experimental results," **IEEE Transaction on Geoscience and Remote Sensing**, vol. 48, no. 10, pp. 3799-3815, 2010.

I. Gustavsson, K. Nilsson, J. Zackrisson, J. Garcia-Zubia, U. Hernandez-Jayo, A. Nafalski, Z. Nedic, Ö. Göl, J. Machotka, M.I. Pettersson, T. Lagö, L. Håkansson, "On objectives of instructional laboratories, individual assessment, and use of collaborative remote laboratories", **IEEE Transactions on Learning Technologies**, Vol. 2, No. 4, 2009

K. Nilsson, J. Zackrisson, M. Pettersson, "Remote Access of Computer Controlled Experiments", **International Journal of Online Engineering (iJOE)**, Vol. 4, No. 4, 2008, pp. 52-56

M.I. Pettersson, "Optimum relative speed discretization for detection of moving objects in wide band SAR, **IET(IEE) Radar, Sonar and Navigation**", Vol. 1, No. 3, 2007, pp. 213-220

M.I. Pettersson, "Detection of moving target in wideband SAR", **IEEE Transactions on Aerospace and Electronics Systems**, Vol. 40, No. 3, July 2004, p 780-9

M.I. Pettersson "Extraction of moving ground targets by a bistatic ultra-wideband and -widebeam SAR system", **IEE Proceedings, Radar, Sonar and Navigation**, Vol. 148, No. 1, 2000, pp. 35-40.

W. Dierking, M.I. Pettersson and J. Askne, "Multi-frequency scatterometer measurements of Baltic Sea Ice during EMAC-95", **International Journal of Remote Sensing**, vol. 20, No. 2, 1999, pp. 349-372

M.I. Pettersson, J. Askne and D.J. Cavalieri, "SAR observations of Arctic freeze-up as compared to SSM/I during ARCTIC91", **International Journal of Remote Sensing**, vol. 17, No. 13, 1996, pp. 2603-2624

## 2. Peer-reviewed conference papers

V.T. Vu, D.I. Alves, B. Palm, M.I. Pettersson, P. Dammert, H. Hellsten, "A Detector for Wavelength Resolution SAR Incoherent Change Detection", IEEE Radar Conference, Boston, USA, 2019

B. Palm, D. Alves, V. Vu, M. Pettersson, F. Bayer, R. Cintra, R. Machado, P. Dammert, H. Hellsten, "Autoregressive models for wavelength resolution SAR change detection", Conf. 10788, Active and Passive Microwave Remote Sensing for Environmental Monitoring, Proceedings of SPIE Vol. 10788, Berlin, 2018

T. Sievert, J. Rasch, A. Carlström, M I. Pettersson, "Comparing reflection signatures in radio occultation measurements using the full-spectrum inversion and phase matching methods, Conf. 10786, Remote Sensing of Clouds and the Atmosphere, Proceedings of SPIE Vol. 10786, Berlin, 2018

M.S. Javadi, M. Rameez, M. Dahl, M.I. Pettersson, "Vehicle Classification Based on Multiple Fuzzy C-Means Clustering Using Dimensions and Speed Features", 22nd International Conference on Knowledge-Based and Intelligent Information & Engineering Systems, Science direct, Procedia Computer Science 126, 1344–1350, 2018

M.S. Javadi, M. Dahl, M.I. Pettersson and W.J. Kulesza , "Design of A Video-Based Vehicle Speed Measurement System - Uncertainty Approach" International Conference on Imaging, Vision & Pattern Recognition (ICIVPR), Fukuoka, Japan, 2018

M. Rameez, M. Dahl, M.I. Pettersson, "Adaptive Digital Beamforming for Interference Suppression in Automotive FMCW Radars", IEEE Radar Conference, Oklahoma City, USA, 2018

V.T. Vu, M.I. Pettersson, "Range Migration Algorithm for Bistatic SAR", IEEE Radar Conference, Oklahoma City, USA, 2018

V.T. Vu, M.I. Pettersson, T.K. Sjögren, A. Gustavsson, "A hybrid GMTI method for reliable detection results in SAR images", International Conference on Recent Advances in Signal Processing, Telecommunications and Computing, SIGTELCOM 2018, Ho Chi Minh, Vietnam, 2018

T.K. Sjögren, P. Frörlind, R. Ragnarsson, A. Haglund, A. Gustavsson, L.M.H. Ulander, V.T. Vu, M.I. Pettersson, "Simultaneous passive SAR imaging and detection of airborne targets", Radar 2017 - International Conference on Radar Systems, Belfast, United Kingdom, 2017

V.L. Barbosa, J. Rasch, A. Carlström, M. I. Pettersson, V.T. Vu, "A Simulation Study of the Effect of Ionospheric Vertical Gradients on the Neutral Bending Angle Error for GNSS Radio Occultation", Progress In Electromagnetics Research Symposium - PIERS 2017, Singapore, 2017

M.I. Pettersson, V.T. Vu, N.R. Gomes, P. Dammert, H. Hellsten, "Incoherent Detection of Man-Made Objects Obscured by Foliage in Forest Area", IEEE Geoscience and Remote Sensing Symposium, IGARSS 2017, Fort Worth, Texas, USA, 2017

- V.T. Vu, M.I. Pettersson, T. Sjögren, M. Dahl, "Measurement of Traffic Flows with SAR – Field Test on the Swedish Road Network", IEEE Geoscience and Remote Sensing Symposium, IGARSS 2017, Fort Worth, Texas, USA, 2017
- T. Sievert, J. Rasch, A. Carlström, M. I. Pettersson, V.T. Vu, "Determining the Reflectivity at the Bottom of the Atmosphere using Radio Occultation, IEEE Geoscience and Remote Sensing Symposium, IGARSS 2017, Fort Worth, Texas, USA, 2017
- A.C. Fabrin, R. Molin, D.A. Alves, R. Machado, F. Bayer, M.I. Pettersson, "A CFAR Optimization for Low Frequency UWB SAR Change Detection", IEEE Geoscience and Remote Sensing Symposium, IGARSS 2017, Fort Worth, Texas, USA, 2017
- V.T. Vu, M. Pettersson, N.R. Gomes, P. Dammert, H. Hellsten, "Wavelength-Resolution SAR Change Detection with Constant False Alarm Rate", IEEE Radar Conference, Seattle, USA, May 2017
- M.S. Javadi, M. Dahl and M. Pettersson, "Change Detection In Aerial Images Using A Kendall's Tau Distance Pattern Correlation", EUVIP2016, 6th European Workshop on Visual Information Processing, Marseille, France, October 2016
- V.T. Viet, T. Sjögren, and M. Pettersson, "Monostatic Pursuit Mode for SAR GMTI Based on Change Detection Methods", Radar2016, 2016 CIE International Conference on Radar, Guangzhou, China, October 2016
- N.R. Gomes, M. Pettersson, V.T. Vu, P. Dammert, H. Hellsten, "Likelihood Ratio Test for Incoherent Wavelength-Resolution SAR Change Detection", Radar2016, 2016 CIE International Conference on Radar, Guangzhou, China, October 2016
- T. Sjögren, V.T. Viet and M. Pettersson, "Experimental result for SAR GMTI using monostatic pursuit mode of TerraSAR-X and TanDEM-X on Staring Spotlight images", EUSAR 2016, 11th European Conference on Synthetic Aperture Radar, Hamburg, June 2016
- V.T. Viet, T. Sjögren, and M. Pettersson, "Experimental Results on Focusing Moving Targets in TerraSAR-X and TanDEM-X Images", IEEE Radar Conference, Philadelphia, USA, May 2016
- V.T. Viet, T. Sjögren, and M. Pettersson, "Local Detection of Moving Target by Focusing in SAR Images", IEEE Radar Conference, Philadelphia, USA, May 2016
- R.D. Molin Jr, A.C.F. Fabrin, P. Sperotto, D.I. Alves, F.M. Bayer, R. Machado, M.I. Pettersson, H. Hellsten, P. Dammert, and L. Ulander, "Iterative Change Detection Algorithm for Low-Frequency UWB SAR", 34th Brazilian Telecommunications and Signal Processing Symposium – SBrT2016, Santarém, Brazil, September 2016
- V.T. Vu, R. Machado, M.I. Pettersson, P. Dammert, H. Hellsten, "SAR image statistics and adaptive signal processing for change detection", in Algorithms for Synthetic Aperture Radar Imagery XXII, Proceedings of SPIE Vol. 9475, Baltimore, US, April 2015



S. Björklund, A. Nelander, M.I. Pettersson, “Fast-Time and Slow-Time Space-Time Adaptive Processing for bistatic radar interference suppression” IEEE International Radar Conference, Arlington, US, May 2015

V. T. Vu, M. I. Pettersson, “Doppler and cross-range resolutions in bistatic forward-looking SAR imaging”, IEEE International Radar Conference, Arlington, US, May 2015

R. Machado, M.I. Pettersson, V.T. Vu, P. Dammert, H. Hellsten, “Empirical-statistical Analysis of amplitude SAR images for change detection Algorithms”, IEEE Geoscience and Remote Sensing Symposium, IGARSS 2015, Milan, Italy

H. Hellsten, R. Machado, M.I. Pettersson, V.T. Vu, P. Dammert, “Experimental results on change detection based on Bayes probability theorem”, IEEE Geoscience and Remote Sensing Symposium, IGARSS 2015, Milan, Italy

V. T. Vu, M. I. Pettersson, “Ground Moving Target Detection and Estimation By Using Dual Speed SAR Platform”, IEEE Radar conference, RadarCon’2014, Cincinnati, US, May 2014

V. T. Vu, D.N. Nehru, M.I. Pettersson, T.K. Sjögren, ” SAR Resolution Enhancement with Circular Aperture in Theory and Empirical Scenario”, IEEE Radar conference, RadarCon’2014, Cincinnati, US, May 2014

V.T. Vu, M.I. Pettersson, “On bistatic forward-looking SAR imaging”, IEEE Geoscience and Remote Sensing Symposium, IGARSS 2014, Quebec, Canada, pp. 3953-3956

V. T. Vu, M. I. Pettersson, S. Björklund, “A Method to Implement SAR Slow-Time STAP in Beamforming Stage of Fast Backprojection Algorithm”, IEEE Geoscience and Remote Sensing Symposium, IGARSS 2014, Quebec, Canada, pp. 3686-3689

S. Björklund, M.I. Pettersson, “A Three-Dimensional Displaced Phase Center Antenna Condition for Clutter Cancellation”, 2014 IEEE 8th Sensor Array and Multichannel Signal Processing Workshop, SAM 2014, A Coruna, Spain, pp. 305-308

M. I. Pettersson, T. K. Sjögren and V. T. Vu, “An Evaluation on Moving Target Parameter Estimation using Synthetic Aperture Radar Systems”, ”, The 4th Asia-Pacific Conference on Synthetic Aperture Radar, APSAR2013, Tsukuba, Japan, 2013

V. T. Vu, D.N. Nehru, M.I. Pettersson, T.K. Sjögren “An Experimental Ground-based SAR System for Studying SAR Fundamentals”, The 4th Asia-Pacific Conference on Synthetic Aperture Radar, APSAR2013, Tsukuba, Japan, 2013

T. K. Sjögren, V. T. Vu, M. I. Pettersson, A. Gustavsson, D. Murdin, L.M.H. Ulander and F. Wang, “Forest clutter suppression for moving target detection in UHF dual channel SAR”, The 4th Asia-Pacific Conference on Synthetic Aperture Radar, APSAR2013, Tsukuba, Japan, 2013

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, “Ground Moving Target detection and Estimation with different SAR linear Flight Tracks”, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Melbourne, Australia, 2013

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Moving Target Focusing with Normalized Relative Speed in Azimuth-Invariant Bistatic SAR", IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Melbourne, Australia, 2013

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "The capability of time- and frequency-domain algorithms for bistatic SAR processing", SPIE Proceedings Vol. 8713, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications X, Baltimore, USA, 2013

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Another possibility to focus moving targets by normalized relative speed in UWB SAR", SPIE Proceedings Vol. 8713, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications X, Baltimore, USA, 2013

V. T. Vu, T. K. Sjögren, M. I. Pettersson, and M. J. Minardi, "The availability of fast time-domain algorithms for circular SAR data processing," in Proc. IET Radar'2012, Glasgow, UK, Oct. 2012, pp. 1–6.

V. T. Vu, T. K. Sjögren, M. I. Pettersson, and M. J. Minardi, "Applications of IRF-CSAR in study of circular SAR systems," in Proc. IET Radar'2012, Glasgow, UK, Oct. 2012, pp. 1–6.

D. Oloumi, M.I. Pettersson, D. Elliott, P. Mousavi, "A TEM horn antenna with non-uniform expansion for oil well monitoring", Joint 2012 IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, APSURSI 2012;Chicago, 2012

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "SAR imaging on ground plane using fast backprojection," in Proc. IEEE RadarCon'2012, Atlanta, US, May 2012, pp. 184–189.

V. T. Vu, T. K. Sjögren, M. I. Pettersson, "Fast Backprojection Algorithm for UWB Bistatic SAR," IEEE National Radar Conference, 2011, pp. 431-434

T. K. Sjögren, V. T. Vu, and M. I. Pettersson, "2D apodization in UWB SAR using linear filtering", IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2011, pp. 1689-1692

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Space Time adaptive Processing for Moving Target detection and Imaging in Bistatic SAR, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2011, pp. 2829-2832

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Fast Factorized Backprojection Algorithm for UWB Bistatic SAR Image reconstruction " IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2011, pp. 4237-4240

V. T. Vu, T. K. Sjögren, M. I. Pettersson, and L. Håkansson, "An approach to suppress RFI in ultrawideband low frequency SAR," IEEE International Radar Conference, 2010, pp. 1381-1385.

T.K. Sjögren, V. Vu, and M.I. Pettersson, "Moving target refocusing algorithm for synthetic aperture radar images", IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2010, pp. 1-4.

V. T. Vu, T. K. Sjögren, and M. I. Pettersson, "Integrating space-time processing into time-domain backprojection process for detection and imaging moving objects IEEE International Geoscience and Remote Sensing Symposium (IGARSS), pp. 1-4.

V. T. Vu, T. K. Sjögren, M. I. Pettersson, and P. A. Marques, "Application of the moving target detection by focusing technique in civil traffic monitoring," IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2010, pp. 1-4.

T. Sjögren, V. Vu, and M.I. Pettersson, "Refocusing Algorithm for Synthetic Aperture Radar," in Proc. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Honolulu, USA, July 2010, pp 1-4.

V.T. Vu, T.K. Sjögren, and M.I. Pettersson, "Fast Detection of Moving Targets by Focusing in UWB Low Frequency SAR," In Proceedings of IEEE Radar Conference RadarCon2009, Pasadena, USA, May 2009

V.T. Vu, T.K. Sjögren, and M.I. Pettersson, "On Apodization Techniques for Ultra-wideband SAR Imaging", In Proceedings of European Radar Conference (EuRAD), Rom, Italy, 2009

V.T. Vu, T.K. Sjögren, and M.I. Pettersson, "Fast Detection of Moving Targets by Focusing in Multi-channel Ultra-wideband SAR", In Proceedings of European Radar Conference (EuRAD), Rom, Italy, 2009

M. Jamil, H.-J. Zepernick, and M.I. Pettersson, "Properties of ambiguity functions for weighted pulse trains with Oppermann sequences" In Proceedings of IEEE International Symposium on Wireless Communication Systems, Siena, Italy, September 2009

M. Fiedler, H.-J. Zepernick, L. Lundberg, P. Arlos, M.I. Pettersson, "QoE-based Cross-Layer Design of Mobile Video Systems: Challenges and Concepts," In Proceedings of IEEE International Conference on Computing and Communication Technologies, Da Nang City, Vietnam, July 2009

M. Jamil, H.-J. Zepernick, and M.I. Pettersson, "Cross-Ambiguity Function of Weighted Pulse Trains with Oppermann Sequences," In Proceedings of IEEE International Symposium on Wireless Communication Systems, Siena, Italy, September 2009

M.I. Pettersson, "Lower Bounds of Moving Target Estimation in Low Frequency UWB SAR", In Proceedings of International Radar Symposium (IRS 2008), Wroclaw, Poland, 2008

T. K. Sjögren, V. T. Vu, M. I. Pettersson, "A Comparative Study of the Polar Version with the Subimage Based Version of Fast Factorized Backprojection", In Proceedings of International Radar Symposium (IRS 2008), Wroclaw, Poland, 2008

T. K. Sjögren, V. T. Vu, M. I. Pettersson, "Moving Target Relative Speed Estimation in the Presence of Strong Stationary Surrounding Using a Single Antenna UWB SAR System", In

proceedings of IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Boston, USA, 2008

V.T. Vu, T.K. Sjögren, M.I. Pettersson, "A Comparison Between Fast Factorized Backprojection and Frequency-Domain Algorithms in UWB Lowfrequency SAR", In proceedings of IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Boston, USA, 2008

V.T. Vu, T.K. Sjögren, M.I. Pettersson, "Moving Target Detection by Focusing for Frequency Domain Algorithms in UWB Low Frequency SAR", In proceedings IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Boston, USA, 2008

M. Jamil, H.-J Zepernick, M. I. Pettersson, "Performance Assessment of Polyphase Pulse Compression Codes", in proc. IEEE International Symposium on Spread Spectrum Techniques and Applications, Bologna, Italy, 2008.

M. Jamil, H.-J Zepernick, M. I. Pettersson, "On Integrated Radar and Communication Systems Using Oppermann Sequences", in proc. IEEE Military Communications Conference, San Diego, USA, 2008

V.T. Vu, T.K. Sjögren, M.I. Pettersson and A. Gustavsson, " A definition on SAR image quality measurements for UWB SAR", In proceedings of SPIE Remote Sensing Conference, Cardiff, UK, 2008

M.I. Pettersson, V.T. Vu, T.K. Sjögren and A. Gustavsson, "Multi-Dimensional Hypotheses Test of Movement Detection in Wide Band Radar Systems Associated with Long Integration Time", Radio Vetenskaplig Konferens 2008 (RVK2008), Växjö, Sweden, 2008

H.-J. Zepernick, M. Fiedler, L. Lundberg, M.I. Pettersson, " Quality of Experience Based Cross-Layer Design of Mobile Video Systems", ITC Specialist Seminar on Quality of Experience, Sweden, 2008

K. Nilsson, J. Zackrisson, M. Pettersson, " Remote Access of Computer Controlled Experiments", International Conference on Interactive Computer aided Blended Learning (ICBL2008), Florianopolis, Brazil, 2008

M.I. Pettersson, "Four-Dimensional Discretization for Detection of Moving Objects in Wide Band SAR", In Proceedings of European Radar Conference (EuRAD), Munich, Germany, 2007

V.T. Vu, T.K. Sjögren, M.I. Pettersson, H.-J. Zepernick and A. Gustavsson, "Experimental Results on Moving Targets Detection by Focusing in UWB Low Frequency SAR", In Proceedings of IET International Radar Conference, Edinburgh, UK, 2007

T.K. Sjögren, V.T. Vu, M.I. Pettersson, H.-J. Zepernick and A. Gustavsson, "Speed Estimation Experiments for Ground Moving Targets in UWB" SAR, In Proceedings of IET International Radar Conference, Edinburgh, UK, 2007

V. Zetterberg, M.I. Pettersson, I. Claesson, "Acoustic passive 3D imaging method for scattered arrays", UDT Pacific 2006 Conference Proceedings, San Diego, USA

M.I. Pettersson, "Relative Speed Step Size in SAR processing for Moving Target Detection", Proceedings of 2006 CIE International Conference on Radar, Shanghai, China, 2006

V. Zetterberg, M.I. Pettersson, L. Tegborg, I. Claesson, "Passive scattered array positioning method for underwater acoustic source" in Proceedings of Oceans 2006 MTS/IEEE Conference, Boston., USA.

M.I. Pettersson, V. Zetterberg, I. Claesson "Detection and imaging of moving targets in wide band SAS using fast time back projection combined with STAP" Proceedings of Oceans 2005 MTS/IEEE Conference "One Ocean", USA. CD-ROM 2005

V. Zetterberg, M. I. Pettersson, I. Claesson, "Comparison between whitened generalized cross correlation and adaptive filter for time delay estimation with scattered arrays for passive positioning of moving targets in Baltic Sea shallow waters" Proceedings of Oceans 2005 MTS/IEEE Conference "One Ocean", USA. CD-ROM 2005

L. Ulander, M. Blom, B. Flood, P. Folio, P-O. Frolind, A. Gustavsson, T. Jonsson, B. Larsson, D. Murdin, M. Pettersson, U. Raaf, G. Stenstrom "The VHF/UHF-band LORA SAR and GMTI system", Proceedings of SPIE - The International Society for Optical Engineering, v 5095, 2003, p 206-215

L. Ulander, M. Blom, B. Flood, P. Folio, P-O. Frolind, A. Gustavsson, T. Jonsson, B. Larsson, D. Murdin, M. Pettersson, U. Raaf, G. Stenstrom, "Development of the Ultra-wideband LORA SAR Operating in the VHF/UHF-band", 2003 IEEE International Geoscience and Remote Sensing Symposium (IGARSS), v 7, 2003, p 4268-4270

M.I. Pettersson, "Detection of Moving targets in Wideband SAR Using Fast Time Backprojection Processing", 4th European Conference on Synthetic Aperture Radar, EUSAR2002, Germany, 2002, pp. 217-221

M.I. Pettersson, "Moving target detection in Wide-Band SAR", Proceedings of 2001 CIE International Conference on Radar, China, 2001, pp. 614-618

M.I. Pettersson, "Focusing of Moving Targets in an Ultra-wide band SAR GMTI System", Proceedings of EUSAR 2000, 3rd European Conference on Synthetic Aperture Radar, Germany, 2000, pp. 837-840

M.I. Pettersson and L.M.H. Ulander, "Jammer suppression in an ultra-wideband and widebeam SAR system", 5th International Conference on Radar systems, Radar'99", 1999, Brest, France

M.I. Pettersson, Ulander L.M.H., Hellsten H., "Simulations of ground moving target indication in an ultra-wideband and wide-beam SAR system", Proceedings of SPIE - The International Society for Optical Engineering, v 3810, Denver, USA, 1999, p 84-95

M.I. Pettersson and L.M.H. Ulander, "Space time adaptive processing in a ultra wideband and wide beam SAR system" RadioVetenskap och Kommunikation 99, del 1, Karlskrona, Sweden, 1999, pp. 191-195

M. Petersson, Grandell, J.; Carlstrom, A.; Pallonen, J.; Ulander, L.M.H.; Hallikainen, M. "Analysis of C-band Backscattering Measurements of thin Arctic Sea Ice", 1995 IEEE International Geoscience and Remote Sensing Symposium IGARSS'95, Vol. 1, Florens, Italy, 1995, pp. 360-362

J. Askne, L.M.H. Ulander, A. Carlström, Y. Sun and M. Pettersson, "Validation of ERS-1 SAR for Arctic ice properties, Proceedings Second ERS-1 Symposium, Hamburg, 1993, pp. 257-262

Dierking, W., J. Askne and M. Pettersson, 1997, Baltic sea ice observations during EMAC-95 using multifrequency scatterometry and EMISAR data. EMAC 94/95 Final Results, Noordwijk, WPP-136 (ESA), 1997, pp 171-177

M.I. Pettersson, J. Askne and D.J. Cavalieri, "Classification of ice properties in the Arctic during freeze-up using SAR and SSM/I", Proceedings of the 14th EARSeL symposium, Göteborg, 1994, pp. 211-217

### **3. Other conference presentations**

T. Sievert, J. Rasch, A. Carlström, M I. Pettersson, "Investigating the use of the phase matching amplitude: Surface reflections and other structures", COSMIC-IROWG joint workshop, Estes Park, CO, USA, September 21-27, 2017

V.L.B. Barbosa, J. Rasch, A. Carlström, M.I. Pettersson, "Quantitative Analysis of the Ionospheric Influence on the Neutral Bending Angle Error for GNSS Radio Occultation Based on COSMIC Data", COSMIC-IROWG joint workshop, Estes Park, CO, USA, September 21-27, 2017

T.Sievert, J.Rasch, A. Carlström, M. Pettersson, "Analysis of accuracy for determining the refractivity at the bottom of the atmosphere", ICGPSRO 2016, 3rd International Conference on GPS RO, 9-11/3 2016, Taipei, Taiwan.

T.Sievert, J.Rasch, A. Carlström, M. Pettersson, "Investigating the use of phase matching for measuring refractivity at the bottom of the atmosphere in radio occultation simulations", OPAC-IROWG 2016 International Workshop on Occultations for Probing Atmosphere and Climate, Leibniz, Austria, 8-14 September 2016

### **4. Patents**

M. Petersson, H. Hellsten and L. Ulander, "Synthetic Aperture Radar System capable of detecting Moving Targets", United States Patent, Patent No. US6518914

### **5. Scientific and technical reports**

M. Dahl, M. Pettersson, T. Sjögren, "Yttäckande mätningar med satellit - Studie av mätmetoder och datafångst", ARENA RAPPORT 2017:01, Year: 2017, NetPort Science Park, Biblioteksgatan 4, 374 35, Karlshamn, Sweden

G. Mbiydzennyuy, J. Widell, C-H. Sandbreck, M. Dahl, M. Pettersson, "Effektutvärdering av kilometerskatt för tunga fordon – en omvärldsstudie", ARENA RAPPORT 2016:01, Year: 2016, NetPort Science Park, Biblioteksgatan 4, 374 35, Karlshamn, Sweden

U. Ekblad, M. Andersson, H. Bergdal, S. Lindström, M. Pettersson, "System av små samverkande satelliter", FOI-Rapport: FOI-R--1149--SE, ISSN 1650-1942, FOI - Swedish Defence Research Establishment, Year: 2004, Linköping, Sweden

M. Pettersson, N. Gustafsson, P. Andersson, "Aspekter på radarnätverk för målföljning av smygsmål som en kryssningsmissil på låghöjd", FOI-Rapport: FOI-R-1467—SE, ISSN 1650-1942, FOI - Swedish Defence Research Establishment, Year: 2004, Linköping, Sweden

M. Blom, M. Herberthson, T. Jonsson, M. Lundberg, D. Murdin, M. Pettersson, G. Stenström, "Hårdvaruverifierande flygmätningar med LORA UHF", FOI-Rapport: FOI-R--1427--SE, ISSN 1650-1942, FOI - Swedish Defence Research Establishment, Year: 2004, Linköping, Sweden

M. Pettersson, "Kalibrering i LORA", FOI-Rapport: FOI-R--0517--SE, ISSN 1650-1942, FOI - Swedish Defence Research Establishment, Year: 2002, Linköping, Sweden

M.I. Pettersson, "Contribution to Wideband SAR Space-Time Processing, and Radar Remote Sensing of Sea Ice", Year: 2000, Technical Report No. 397, ISBN 91-7197-966-2, Department of Signals and Systems, School of Electrical and Computer Engineering, Chalmers University of Technology, Gothenburg, Sweden

M. Pettersson, "Microwave remote sensing of arctic sea ice during freeze-up using radar and passive radiometry", Year: 1995, Technical Report No. 219, ISBN 91-7197-233-1, Department of Signals and Systems, School of Electrical and Computer Engineering, Chalmers University of Technology, Gothenburg, Sweden

M. Pettersson, "Metod för mätningar av absorptionsparametrar i halvledarlaserbaserat gasanalyssystem", Year: 1993, Department of Optoelectronics, School of Electrical and Computer Engineering, Chalmers University of Technology, Gothenburg, Sweden

I have written more scientific and technical reports during my time as an employee at FOI and Ericsson that are not public.