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2021 IEEE SWEDEN CHAPTER AGM

PRESENTER : AMLESET KELATI, SENIOR MEMBER IEEE

CHAIR, SIGNAL PROCESSING SOCIETY (SPS),

IEEE SWEDEN SECTION

OCTOBER 29, 2021

Senior member of IEEE, Joined IEEE, as student membership 1999, while my master studies Digital Communication System at Chalmers

Chair: Amleset (Ami) Kelati
amlikelati@ieee.org
Ph.D. KTH – UTU
Her Reserch is focused on Internet of Things based data mining, signal processing, and feature extraction implementation on hardware(FPGA), and, Developing pattern clustering, and signal classification using ML algorithms.

Vice Chairman: Amin Karimi Behbahani

Secretary / Treasurer: Ilayda Yaman Ilayda
Ph.D. Lund University,
Her research is on fusing computer vision and wireless communications to design low-power hardware using machine learning algorithms.

IEEE Signal Processing Society ®

Signal Processing

- Speech and Audio Processing
- Speech Recognition
- Hearing Aids
- Autonomous Driving
- Image Processing and Analysis
- Wearables
- Data Science
- Communications Systems and Networks

IEEE Signal Processing Society®

History

- 70 years, the Signal Processing Society has been progressing the study of signal processing
- 1948 as the Professional Group on Audio of the Institute of Radio Engineers (IRE) – IEEE's first society –
- Today, signal processing is known as the enabling technology for the generation, transformation and interpretation of information
- Signal Processing Society has more than 19,000 members through 170 Chapters worldwide

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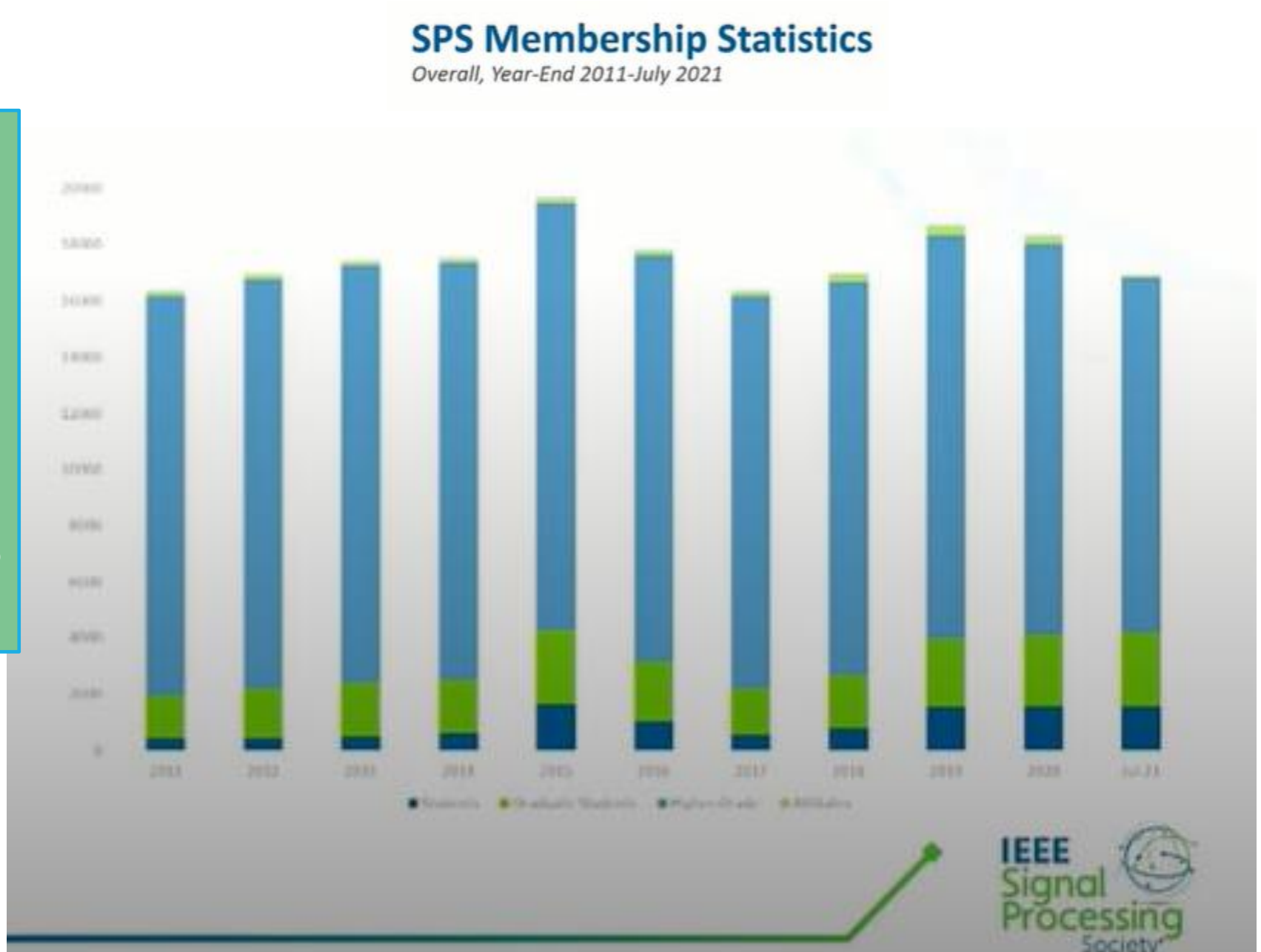
Members SPS Sweden **around** 160

- **Life Members - 8**
- **Fellow member - 5**
- Life fellow member - 4
- Senior Member - 30
- Members- 110
- Life member - 4
- Graduate Student Member - 15



- Awards for many years
- Recently. October 14, 2021 - *SPS Sweden chapter is awarded the amount of $500 for the number of new members in 2020*

IEEE SIGNAL PROCESSING SOCIETY SWEDEN CHAPTER DISTINGUISHED LECTURE (WEBINAR)/SPARSE SAMPLING: THEORY AND APPLICATIONS, 19 MAY, 2021

[Sweden Section Jt. Chapter, AP03/MTT17]
[Sweden Section Chapter,SP01]

Prof. Pier Luigi Dragotti

Topic: **Sparse Sampling: Theory and Applications**

Modelling signals as sparse in a proper domain has proved fruitful in many signal and image processing applications. Recently, the notion of sparsity has led to new sampling theories that have demonstrated that the prior knowledge that signals can be sparsely described in a basis or in a parametric space can be used to sample and perfectly reconstruct such signals at a significantly reduced rate. The insight that sub-Nyquist sampling can, under some circumstances, allow perfect reconstruction is revolutionizing signal processing, communications and inverse problems.

In this talk we first recall that sampling involves the reconstruction of continuous-time or continuous-space signals from discrete measurements (samples) and show how to relate the discrete measurements to some properties of the original continuous signal (e.g., its Fourier transform at specific frequencies). This is achieved by using the theory of approximation of exponentials and the so called generalized Strang-Fix conditions. Given this partial knowledge of the original signal, we then reconstruct it by using sparsity priors and in particular we provide exact reconstruction formulas for specific classes of 1-D and 2-D signals.

We then consider applications of these ideas in super-resolution imaging and inverse problems. In particular, we present a method for enhancing image resolution which combines sparse sampling methods with learning and a method for estimating diffusion fields driven by localized sources using spatio-temporal sensor measurements.

Biography:

Pier Luigi Dragotti is Professor of Signal Processing in the Electrical and Electronic Engineering Department at Imperial College London. He received the Laurea Degree (summa cum laude) in Electronic Engineering from the University Federico II, Naples, Italy, (1997); the Master degree in Communications Systems from the Ecole polytechnique f´ed´erale de Lausanne (EPFL), ´ Switzerland (1998); and PhD degree from EPFL, Switzerland, (April 2002). Before joining Imperial College in November 2002, he was a senior researcher at EPFL working on distributed signal processing for the Swiss National Competence Center in Research on Mobile Information and Communication Systems. Prof. Dragotti has also held several visiting positions. He was a visiting student, Stanford University (1996); summer researcher, Mathematics of Communications Department at Bell Labs, Lucent Technologies, Murray Hill, NJ (2000); and visiting scientist, Massachusetts Institute of Technology (2011).

Prof. Dragotti is an IEEE Fellow (2017). He was Editor-in-Chief, IEEE Transactions on Signal Processing (2018-2020); Member, IEEE SPS Fellow Evaluation Committee (2020-21); Associate Editor, IEEE Transactions on Image Processing (2006-2009); Elected Member, IEEE Image, Video and Multidimensional Signal Processing Technical Committee (2008-2013) where he acted as Chair of the award sub-committee (2011-2013); Member, IEEE Signal Processing Theory and Methods Technical Committee (2013-2018); Member, Computational Imaging Technical Committee (2015-2020); and Technical Co-Chair, European Signal Processing Conference (Eusipco) (2012).

Prof. Dragotti is also the recipient of a European Research Council (ERC) Investigator Award, which is awarded to "exceptional research leaders to pursue ground-breaking, high-risk projects" (2011-2016).

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- Sweden Section Jt. Chapter,
- AP03/MTT17
- Sweden Section Chapter,SP01

Modern Optimization and Machine Learning Workshop

Agenda, May 19, 2021 – All times are in CEST

Time	Presenter	Topic
09.00		Welcome
09.15	Mats Gustafsson, Lund University	Best and Better than Best – The Quest for Optimal Antennas
09:40	Martin Berggren, Umeå University	3D Acoustic Shape Optimization Using Cut Finite Element Methods
10:05		Coffee Break
10:20	Lars Olsson Fhager, Lund University	Classification of mmW Hand Gesture Radar Signatures
10:45	Cosme Culotta López, RWTH Aachen University	A practical approach to sparse recovery in spherical near-field antenna measurements
11:10	Isaac Skog, Linköping University	Tensor-Field Based Localization Using Sensor Arrays – A Machine Learning Approach
11:35	Jevgenija Rudzusika, Royal Institute of Technology	Data Driven Large-Scale Convex Optimisation
12:00	Adam Andersson, Saab Surveillance and Chalmers University of Technology	Deep Learning Accelerated Computations for Radar Related Applications
12:25		Lunch
13.25	Keynote by Pier Luigi Dragotti, Imperial College	Sparse Sampling: Theory and Applications
14:25	Christer Larsson, Saab Dynamics and Lund University	Radar Cross Section Analysis with BPDN
14:50		Coffee Break
15:05	Alexander Karlsson, Saab Surveillance and Royal Institute of Technology	Stepped Frequency Pulse Compression with Non-Coherent Radar Using Deep Learning
15:30	Ben Nel, Lund University	Optimal Design for Microstrip Antennas
15:55	Emadeldeen Hassan, Umeå University	Multilayer Topology Optimization of Wideband Waveguide Transitions
16:20	All	Discussion and Summary
16:45		End of Workshop

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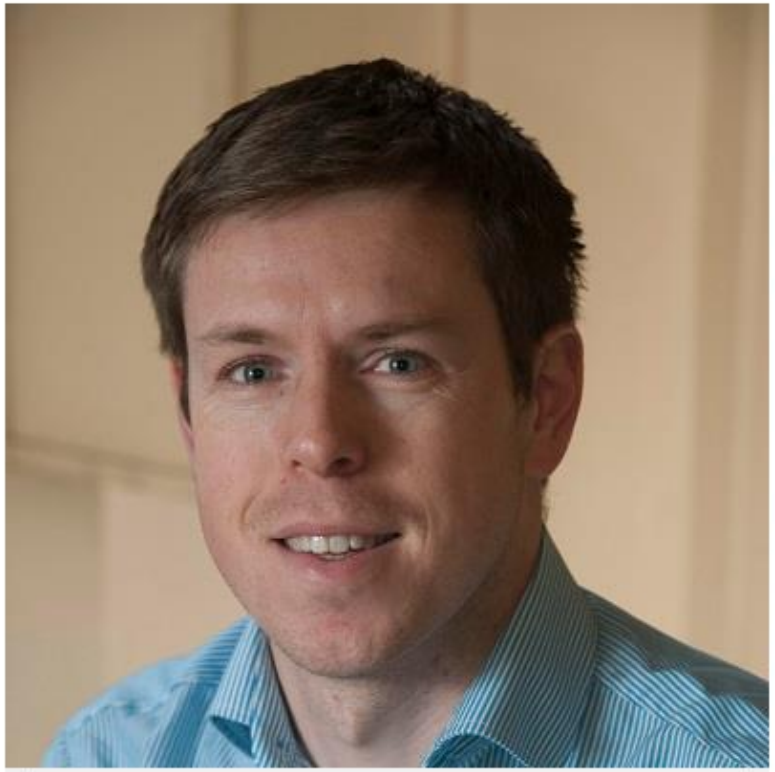
SWEDEN SECTION CHAPTER,SP01: TECHNICAL SEMINAR: "MULTI-SENSOR FUSION USING FACTOR GRAPHS: TIGHTLY COUPLED ODOMETRY AND MAPPING.“ 16, DEC 2020

SPEAKERS



Dr. Maurice Fallon of University of Oxford

Topic: Multi-sensor Fusion using Factor Graphs: Tightly Coupled Odometry and Mapping

Biography:

Dr. Maurice Fallon is a Royal Society University Research Fellow at University of Oxford, within Oxford Robotics Institute. (A position equivalent to Assistant Professor in the UK system). His research is focused on probabilistic methods for localization and mapping. He has also made research contributions to state estimation for legged robots and is interested in dynamic motion planning and control. Of particular concern is developing methods which are robust in the most challenging situations by leveraging sensor fusion.

Dr. Fallon's PhD was the field of acoustic source tracking at University of Cambridge. Immediately after his PhD he moved to MIT as a post-doc and later research scientist in the Marine Robotics Group working on robot mapping. He was then the perception lead of MIT’s team in the DARPA Robotics Challenge – a multi-year international competition developing technologies for semi-autonomous humanoid exploration and manipulation in disaster situations. After a period at University of Edinburgh, he moved to Oxford in April 2017 and started the Dynamic Robot Systems Group. He co-leads are group of 20 students and researches with multiple EU and UK funded research projects.

Address:Sweden

PAST ACTIVITIES, MAINLY GUEST LECTURES AND SEMINARS.

- Challenges in designing large neural networks
- Perceptual Audio Coding
- Image based chemical and genetic screening: Classical to DL methods

TO HAVE MORE ACTIVITY - SOME IDEAS

- Joint activities with AP/MTT, WIE, ED, other chapters
- Joint activity SP & CAS Chapter

- A Signal Processing for Deep Learning Workshop in Summer 2022

- EURASIP may help
- We will also approach IEEE
- Swedish Signal and Information Processing workshop

- Tutorials and poster presentation

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Thank you

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