IEEE

2018 ICSEE International Conference on the Science of Electrical Engineering

December 12-14, 2018, Eilat, Israel

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Welcome Message

Dear Colleagues,

As part of the activities of the Israeli section of IEEE, we will be holding our 30th biennial convention in Eilat during December 12-14, 2018. Since the last conference we are using the name " The International Conference on the Science of Electrical Engineering" (ICSEE), in order to better reflect our commitment to contributing to and keeping abreast of the latest developments in the science and technology of electrical engineering.

The 2018 convention will feature over 200 presentations in a wide spectrum of disciplines such as signal processing, control theory, circuits and systems, energy, power electronics, computers, communications, antennas, and electro-optics. We therefore expect the convention to be conducive to the exchange of knowledge and ideas between different areas, thereby serving to advance each of the individual disciplines.

This year we are proud to introduce special full-day symposia that will complement the traditional sessions and will include longer and more detailed talks on specific subject areas. Many internationally renowned keynote and invited speakers will present their work and talk about their views on their respective branches of science. The three symposia that will take place this year will be on the topics of Optoelectronics, Deep learning, and Circuits and systems. In addition to the symposia, the conference will also feature several special sessions on a variety of topics, with the participation of key researchers from around the globe.

I would like to use this opportunity to express my deepest gratitude to the many individuals who have been contributing much of their time to the organization and planning of this convention. I am in particular indebted to Dr. Yuval Beck, the secretary of the IEEE Israel Section, Dr. Anelia Somekh-Baruch, the program chair, and to the organizers of the symposia and special sessions. The conference would not have been possible without their dedication. I would also like to thank the authors, the session chairs, and all those who have invested efforts into ensuring the success of this convention.

Respectfully yours,

Prof. Uri Shaked
Chair of the Israel IEEE Section

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ABBREVIATIONS

COD- Coding

COM- Communications

COMVI- Computer Vision

CP- Computers

DL- DEEP Learning

IMP- Image Processing

IT- Information Theory

ML- Machine Learning

OPE- Optoelectronics

OPD- Optical Devices

POW- Power

SCN- Systems and Control

SP- Signal Processing

SX- Special Session

SY- Symposium

WEDNESDAY, DECEMBER 12ᵀᴴ 2018

Venue	A Sapphire Hall	B Topaz Hall	C Opal Hall	D Edom Hall	E Canaan Hall	F Ophir Hall	G Eden Hall
10:30 - 16:00	Registration						
13:30 - 16:30	Short Course on Deep Leering- at Edom Hall						
17:00 - 19:00 Session 1	ML1 Machine Learning 1	SCN1 Systems and control	CP1 Computers	SP Speech	NA	SX2 Special Session on Smart Grid	COM1 Communication1
19:00 - 20:00	Dinner at the hotels						
20:30 - 22:00	Poster session and Welcome Cocktail at Canaan Hall						

THURSDAY, DECEMBER 13TH 2018

Venue	A Sapphire Hall	B Topaz Hall	C Opal Hall	D Edom Hall	E Canaan Hall	F Ophir Hall	Eden Hall
08:30 - 10:30 Session 1	**SY1** Symposium on electro-optics		**SY3** Symposium on Deep Learning	**SP2** Signal processing	**SX3** Special session IT	**SX2** Power Systems and Smart Grid	**Bio**
10:30-11:00			Coffee Break				
11:00-13:00 Session 2	**SY1** Symposium on electro-optics	**SY2** Symposium on circuits and systems	**SY3** Symposium on Deep Learning	**SP3** Signal processing Applications	**SX3** Special session IT(cont)	**POW 1** Power elect	**COM2**
13:00 - 14:00			Lunch break				
14:00 - 16:00 Session 3	**OPE1** Optoelectronics	**SY2** Symposium on circuits and systems	**SY3** Symposium on Deep Learning	**SCN2** Systems and control	**IT1**	**POW2** Power 2- Systems	**ED1** Electronic devices
16:00 - 16:20			Coffee Break				
16:20 - 18:20 Session 4	**OPE2** Optoelectronics	**SY2** Symposium on circuits and systems	**SY3** Symposium on Deep Learning	**SCN3** Systems and control 3	**IT2**	**POW3** Power 3	
18:30 - 20:00				Dinner at the hotels			
20:30 - 22:30				IEEE Award Ceremony + Show and Cocktail at Canaan Hall			

FRIDAY, DECEMBER 14TH 2018

Venue	A Sapphire Hall	B Topaz Hall	C Opal Hall	D Edom Hall	E Canaan Hall	F Ophir Hall	G Eden Hall
08:30-10:30 Session 1	**COMVI1** Computer Vision 1		**SX1** Special Session on speech Processing	**CP2** Computers 2	**ML2** Machine Learning2	**Micro Antenna** EMC1	
10:30-11:00				Coffee Break			
11:00-13:20 Session 2	**COMVI2** Computer Vision 2	**SX4** Special Session on Deep Learning	**SX1** Special Session on speech Processing (cont.)	**MV** Machine learning and Vision			
13:20 - 14:20				Lunch			

Detailed Schedule of ICSEE 2018 Sessions
(For Symposia see pages 49 - 54)

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2018 ICSEE International Conference on the Science of Electrical Engineering

December 12-14, 2018, Eilat, Israel

Program

Wednesday, December 12th, 2018

Session 1:

17:00-19:00	ML1: Machine Learning 1	Sapphire Hall
	Chair: Amir Natan, Tel Aviv University	

17:00 - 17:20   **Multi-Layer Sparse Coding: The Holistic Pursuit and The Multi-Layer ISTA Architecture**
Aviad Aberdam; Jeremias Sulam; Michael Elad
Technion, Israel

17:20 - 17:40   **Deep Energy: Using Energy Functions for Unsupervised Training of DNNs**
Alona Golts, Michael Elad
Technion, Israel

17:40 - 18:00   **Deep Scalar Quantization for Channel Estimation**
Nir Shlezinger ; Georgee Tsintsadze ; Matan Shohat ; Yonina Eldar
Technion, Israel

18:00 - 18:20   **Uniform Noise Injection for Quantization of Neural Networks**
Chaim Baskin
Technion, Israel

18:20-18:40   **Size and Temperature Transferability of Direct and Local Deep Neural Networks for Atomic Forces**
Nataly Kuritz; Goren Gordon; Amir Natan
Tel Aviv University, Israel

18:40-19:00   **Identifying Abusive Comments in Hebrew Facebook**
Chaya Liebeskind and Shmuel Liebeskind
Jerusalem College of Technology, Israel

Wednesday, December 12th, 2018

| 17:00-19:00 | **SCN1: Systems and Control 1** | **Topaz Hall** |
| | Chair: Eli Gershon, Holon institute of Technology | |

17:00 - 17:20 **Estimating Sea State Using Local Sensors**
Sharon Farber[1], Itzik Klein[2] and Morel Groper[1]
(1) Haifa University, Israel (2) Technion, Israel

17:20 - 17:40   **Bio-Inspired Micro Drone**
Boaz Ben-Moshe, Amit Kashi, Yael Landau and Revital Marbel
Ariel University, Israel

17:40 - 18:00 **Unspread the Jam: Scheduling Traffic Lights to Reduce Congestion**
Yoav Levi, Ayal Taitler and Isaac Keslassy
Technion, Israel

18:00 - 18:20 **Application of the SPOC form to Estimation and Identification of Nonlinear Systems**
Ilan Rusnak
RAFAEL, Israel

18:20-18:40 **A Randomized Algorithm for Robust Stabilization via Static-output-feedbacks**
Yossi Peretz, Oria Merzbach and Simon Moyal
Lev Academic Center, Jerusalem, Israel

18:40 - 19:00 **Considerate Control and Bristol Gains**
Eduard Eitelberg
ORT Braude College, Israel

17:00-19:00	**CP1: Computers 1**	**Opal Hall**

Chair: Mark Shifrin, Ben Gurion University

17:00 - 17:20   **Solving the Capacitated Open Vehicle Routing Problem Algorithm, Based on Probability Distribution Modeling of Saving Matrix**
Uri Lipowezky, Ianir Ideses and Boris Korenfeld
gett, Israel

17:20 - 17:40   **Efficient Hardware/Software partitioning for Heterogeneous Embedded Systems**
Erez Manor and Shlomo Greenberg
Ben- Gurion University, Israel

17:40– 18:00   **Cache Prefetching in Embedded DSPs**
Adiel Vaintraub, Roger Kahn and Shlomo Weiss
Tel Aviv University, Israel

18:00 - 18:20   **Probability Based Keys Sharing for IOT Security**
Guy Leshem, Esther David and Menachem Domb
Ashqelon Academic College (AAC), Israel

18:00 - 18:40   **Scaling of cloud resources by principal component analysis**
Mark Shifrin[1], Omer Gurewitz[1] and Erez Biton[2]
(1)Ben Gurion University Israel (2) Nokia- Israel

Wednesday, December 12th, 2018

17:00-19:00	**SP: Signal Processing- Speech**	**Edom Hall**
	Chair: Irit Ofer, Afeka Tel-Aviv College of Engineering	

17:00 - 17:20   **Multi-Speaker Direction of Arrival Estimation using SRP-PHAT Algorithm with a Weighted Histogram**
Elior Hadad and Sharon Gannot
Bar-Ilan University,Israel

17:20 - 17:40   **Robust Speaker Clustering Quality Estimation**
Yishai Cohen and Itshak Lapidot
Afeka Tel-Aviv College of Engineering, Israel

17:40 - 18:00   **Multi-microphone Voice Activity Detector Based on Steered-Response Power Output Entropy**
Ofer Schwartz[1], Aviv David[1], Ofer Shahen-Tov[1] and Sharon Gannot[2]
(1) Ceva- Israel (2) Bar-Ilan University, Israel

18:00 - 18:20   **Prosodic Feature Criterion for Hebrew Using Different Feature Sets**
Ben Fishman[1] and Irit Opher[2]
(1) Tel Aviv University, Israel (2) Afeka Tel-Aviv College of Engineering, Israel

18:20 - 18:40   **Audio Segmentation and Analysis of Bird Vocalizations**
Hagai Barmatz[1], Dana Klein[2], Yoni Vortman[2], Sivan Toledo[1] and Yizhar Lavner[2]
(1) Tel Aviv University-Israel (2) Tel Hai Collage , Israel

Wednesday, December 12th, 2018

17:00-18:30	**SX2: Power Systems and Smart Grid special session- Part 1**	**Ophir Hall**

Chairs: Yoash Levron[1] and Yuval Beck[2], (1) Technion (2) Tel Aviv University
Sponsored by: **solar**edge

17:00-17:30   **Concerning the Stability of Microgrids, Using High Order Models of Synchronous Generators**
Prof. George Weiss
Tel Aviv University, Israel

17:30-18:00   **Smart Monitoring of Transmission and Distribution Systems**
Prof. Elias Kyriakides,
KIOS Research Center, University of Cyprus, Cyprus

18:00 - 18:30   **Non-Intrusive Load Monitoring Techniques**
Dr. Yuval Beck
Tel Aviv University, Israel

Wednesday, December 12th, 2018

| 17:00-19:00 | **Com1: Communications 1** | **Eden Hall** |

Com1: Communications 1   **Eden Hall**
Chair: Dan Raphaeli, Tel Aviv University

17:00 - 17:20   **Berlekamp-Massey Algorithm: Euclid in Disguise**
Ishai Ilani
Western Digital, Israel

17:20 - 17:40   **Non Binary Polar Codes with Equidistant Transform for Transmission over the AWGN Channel**
Sinan Kahraman,
Bilkent University, Turkey

17:40 - 18:00   **Peak to Average Power Ratio Reduction for Filter Bank Multi Carrier Modulation using Iterative Clipping and Filtering**
Arie Reichman[1], David Levi[1] and Dov Wulich[2]
(1) Ariel University, Israel (2) Ben Gurion University, Israel

18:00 - 18:20   **Methods of Nonlinear Fourier-based Optical Transmission with Periodically-Extended Signals**
Morteza Kamalian[1], Jaroslaw Prilepsky[1], Anastasiia Vasylchenkova[1], Dmitry Shepelsky[2] and Sergei Turitsyn[1]
(1) Aston University, United Kingdom (2) B. Verkin Institute for Low Temperature Physics and Engieering, Ukraine

18:20 - 18:40   **Transmitter Precoding for Reducing Receiver Dynamic Range in Wireline Channels**
Or Levi and Dan Raphaeli
Tel Aviv University, Israel

18:40 - 19:00   **LCD TEMPEST Attack Reloaded**
Mordechai Guri and Matan Monitz
Ben Gurion University, Israel

Poster Session

Poster Session: 20:30 - 22:00

Chair: Uri Shaked, Tel Aviv University

- **Characterization of Electromagnetic Interference Conducted in DC-DC Buck Converter LED Light in Accordance with CISPR 25 Class**
  Carlos Magno B. De Araújo, *PWM Automation and Protection of Power Systems, Brazil*

- **Real Life Applicative Timing Algorithm for A Smart Junction with Social Priorities and Multiple Parameters**
  Orly Barzilai[1], Nadav Voloch[2], Alon Hasgall[1] and Orna Lavi Steiner[1],
  (1)The college of academic studies- Israel (2) Ben Gurion University, Israel

- **The Equivalence of Knapsack and Waterfilling Problems**
  Mohammed Khan, IITH, India

- **Minimization Magnetic Coupling of Perpendicular Coils Winded Inside and Outside**
  Toroidal Core made Thin Magnetic Ribbon
  Efim Lokshin[1], Taniana Minav[2] and Moshe Averbukh[1] , (1)Ariel University-Israel (2) Aalto *University, Finland*

- **Traveling-Wave Ring Oscillator - Simulations and Prototype Measurements for a New Architecture for a Transmission Line Based Oscillator**
  Boris Likhterov and Belenky Alexande
  Ben Gurion University, Israel

- **Cooperation Between Autonomous Marine Platforms**
  Coral Sharoni, Boris Braginsky and Hugo Guterman
  Ben Guirion University, Israel

- **Geometrical Correction of the Side Scan Sonar Image**
  Tal Sheffer and Hugo Guterman
  Ben Gurion University, Israel

- **Preliminary Dynamic Parameters Comparison of Asymmetric (Ultimo CPQ 2300S, JSR Co.) and Double-Layer (BCAP3400, Maxwell Co.) Ultracapacitors**
  Asher Yahalom, Yakov Abitbul and Moshe Averbukh
  Ariel University, Israel

Wednesday, December 12th, 2018

- **Optimal Time-Sharing for Multiple-Input Single Ended Primary Inductor Converter (SEPIC)**
  Kamal Ibn Bari, Yoram Horen, Svetlana Bronshtein and Dmitry Baimel
  CSE, Israel

- **Parallel Implementation of the LW learning Algorithm** Joel Ratsaby and Alon Sabaty,
  Ariel University, Israel

- **Optically Transparent Antennas**
  Haim Matzner[1], Ely Levine[2] and David Lebovitz [2]
  (1) Holon Institute of Technology, Israel (2) Afeka College of Engineering- Israel

- **Point Cloud Registration Refinement in an Urban Environment using 2D Edge-Maps**
  David Avidar, David Malah and Meir Barzohar
  Technion, Israel

- **Matching and Searching the Dead Sea Scrolls**
  Taivanbat Badamdorj, Adiel Ben-Shalom and Nachum Dershowitz
  Tel Aviv University, Israel

- **Indoor Positioning with Unsynchronized Sound Sources**
  Guy Feferman, Michal Blatt and Alon Eilam
  Technion, Israel

- **Image Inpainting on surfaces and in volumetric Imaging**
  Ofir Krengel
  Technion, Israel

- **Phase-Shifterless Scanning Array Antenna Based on Microstrip Elements**
  Haim Matzner[1], Ely Levine[2], Liz Volynsky[1] and Jjoa Vargas[1]
  (1) Holon Institute of technology, Israel (2) Afeka college of Engineering, Israel

- **Automatic Detecting of Insulting Sentences in a Conversation**
  Merav Allouch[1], Amos Azaria1, Rina Azoulay[2], Ester Ben-Izchak[1], Moti Zwilling[1] and Ditza A. Zachor[3]
  (1) Ariel University, Israel (2) Jerusalem College of Technology, Israel (3) Tel Aviv University, Israel

- **ADHD Detection from Driving Patterns**
  Lihi Dery and Oren Musica
  Ariel University, Israel

- **Fish-Eye Urban Navigation**
  Roi Yozevitch
  Ariel University, Israel

- **Hybrid DG-Battery System for Off-Grid Consumer**
  Guy Cohen and Alon Kuperman
  Ben Gurion University, Israel

- **Large Scale Sensor Information Fusion Applied to Object Recognition in Multidimensional Imaging**
  Alon Tairy, Shimrit Maman, Dan Blumberg and Stanley Rotman
  Ben- Gurion University, Israel

- **Efficient constant envelope orthogonal modulation**
  Yael Balal, Monika Pinchas and Yosef Pinhasi
  Ariel University, Israel

- **High Speed and High Sensitivity Fiber Bragg Grating Interrogator Based on The Rf Phase-Shift Technique**
  Ziv Glasser, Yochai Ofer, Rita Abramov and Shmuel Sternklar
  Ariel University, Israel

- **Audio Retrieval by Voice Imitation**
  Mohamad Khateeb, Samah Khawaled and Hadas Benisty
  Technion, Israel

- **Big Data Analysis of Empoyee Turnover in Global Media Companies, Google, Facebook and Others**
  Alon Sela[1] and Hila Chalutz Ben-Gal[2],
  (1) Ariel University- Israel (2) Afeka college of Engineering, Israel

- **Active Power Filter Applications: State of the Art**
  Yevgeny Mogilevsky and Marcos Roitman
  SCE, Israel

- **Generation of "Optimal" PN Sequences for Use in Direct Sequence Spread Spectrum**
  Yonatan Ashsuh and Shlomo Engelberg
  Jerusalem College of Technology, Israel

- **Additive, Retentive Penalty Method for Multidimensional NILM Algorithms**
  Mattan Serry, David Sriker, Avi Caciularu, Ram Machlev and Yuval Beck
  Tel-Aviv University, Israel

Wednesday, December 12th, 2018

- **Information Transmission of Chirped Acoustic Signals and Power Transfer in Medical Implants**
Beniamin Kantor, Alex Krichevsky, Yuval Shklarsh and Denis Dikarov
Technion, Israel

- **Self-Bias Circuits for Boost Derived Converters**
Alex Abramovitz and Doron Shmilovitz
Tel Aviv University , Israel

- **The Advantage of Irregular Pulse Shape for Non-Orthogonal Multiple Access**
Yossi Dadush and Ram Zamir
Tel Aviv University, Israel

- **Harnessing Machine Learning for interpersonal physical alignment**
Roi Yozevitch, Hila Gvirts, Ornit Apelboim and Elhanan Mishraky
Ariel University - Israel

- **Phase-shift-amplified Interferometry**
Moshe Ben Ayun, Egor Liokumovitch and Shmuel Sternklar
Ariel University, Israel

Thursday, December 13th, 2018

Session 1:

08:30-10:10	**SP2: Signal Processing2**	**Edom Hall**
	Chair: Arie Yardor, Tel Aviv University	

08:30 - 08:50 **Online Adaptive Quasi-Maximum Likelihood Blind Source Separation of Stationary Sources**
Amir Weiss and Arie Yeredor,
Tel-Aviv University, Israel

08:50 - 09:10 **An ICA Algorithm for Separation of Convolutive Mixture of Periodic Signals**
Doron Benzvi and Adam Shafir
Jerusalem college of engineering, Israel

09:10 - 09:30 **Analysis of Piecewise Fractional Brownian Motion Signals and Textures**
Samah Khawaled, Ido Zachevsky and Yehoshua Y. Zeevi
Technion, Israel

09:30 - 09:50 **Detection of Data Injection Attacks on Decentralized Statistical Estimation**
Or Shalom[1], Amir Leshem[1], Anna Scaglione[2] and Angelia Nedic[2]
(1) Bar Ilan University, Israel (2) Arizona State University, USA

09:50 - 10:10 **Recovery of Signals Encoded by Sample-and-Hold Asynchronous Sigma-Delta Modulation**
Dominik Rzepka, Dariusz Kościelnik, Jakub Szyduczyński and Marek Miśkowicz- *AGH University of Science and Technology, Poland*

Thursday, December 13th, 2018

| 08:30-10:30 | **SX3: Special Session on IT part 1** | **Canaan Hall** |

Chair: Yuval Kochman, Hebrew University

08:30 - 08:50 **Distributed Information Bottleneck, and more: A Unified Information Theoretic View**
Shlomo Shamai,
 Technion, Israel

08:50 - 09:10 **Information Bottleneck for an Oblivious Relay with Channel State Information: The Scalar Case**
Giuseppe Caire, TUB-Germany, Shlomo Shamai *technion Israel*,
Antonia Tulino *Univ. Naples Italy*, Sergio Verd'u *Princeton NJ*, and Cagkan Yapar,
TUB-Germany

09:10 - 09:30 **Energy Conservation in Optical Fibers with Distributed Brick-Walls Filters [Joint work with Javier Garcia (TU Munich) and Hassan Ghozlan**
Gerhard Kramer- TUM- Germany, Javier Garcia (TU Munich) and Hassan Ghozlan (Intel)

09:30 - 09:50 **Can Negligible Cooperation Increase Network Capacity?**
Michael Langberg,
 UB, USA

09:50 - 10:10 **Shaping of Circular Quadratic Amplitude Modulations (CQAM)**
Johannes Van Wonterghem1, Joseph J. Boutros[2] and Marc Moeneclaey[1],
(*1) Ghent University-Belgium (2) Texas A&M University- Qatar*

10:10 - 10:30 **The Semi-Arbitrarily Varying Broadcast Channel Revisited**
Tibor Keresztfalvi and Amos Lapidoth
 ETH, Zurich

08:30-10:30   **SX2: Power Systems and Smart Grid special session- Part 2**   **Ophir Hall**
Chairs: Yoash Levron[1] and Yuval Beck[2], (1) Technion (2) Tel Aviv University
Sponsored by: solaredge

08:30 - 09:00   **Graph Signal Processing for Smart Grid Applications**
Tirza Routtenberg
Ben Gurion University, Israel

09:00 - 09:40   **Utilizing distributed generation resources to create a virtual power plant**
Ilan Yoskovich
Solar Edge , Israel

09:40 - 10:10   **Toward High Penetration Level of Renewable Sources-**
Challenges and Opertunities
Prof. Yoash Levron
Technion, Israel

10:10 - 11:40   **Intelligent Distribution System for Emergency Metropolitan Power**
Supply
Zdenek Muller,
CTU, Czech Republic

| 08:30-10:10 | **Bio: Bioelectronics** | **Eden Hall** |

Chair: Zigel Yaniv, Ben Gurion University

08:30 - 08:50   **Eye Tracking Control in Visual Prostheses**
Avi Caspi
Jerusalem College of Technology, Israel

08:50 - 09:10   **Memristors as Artificial Biochemical Reactions in Cytomorphic Systems**
Hanna Abo Hanna, Loai Danial, Shahar Kvatinsky and Ramez Daniel
Technion, Israel

09:10 - 09:30   **Light through Optical Powered Glasses Effect EEG Visually Evoked Potentials**
John William Carey Medithe[1] and Usha Rani Nelakuditi[2]
(1) Methodist College of Engineering and Technology, India
(2) Vignan's University, India

09:30 - 09:50   **Networks of Ribosome Flow Models for Modeling and Analyzing Intracellular Traffic**
Alexander Ovseevich[1], Itzik Nanikashvili[2], Yoram Zarai[2], Tamir Tuller[2] and Michael Margaliot[2]
(1) Institute for Problems in Mechanics-Russia (2) Tel Aviv University, Israel

09:50 - 10:10   **Detecting Masses in Mammograms using Convolutional Neural Networks and Transfer Learning**
Mor Yemini[1], Yaniv Zigel[1] and Dror Lederman[2]
(1) Ben Gurion University, Israel, (2) Holon Institute of Technology, Israel

Session 2:

11:00-12:40	**SP3: Signal Processing 3:**	**Edom Hall**
	Chair: Stanley Rotman, Ben Gurion University	

11:00 - 11:20 **Examining Change Detection Methods for Hyperspectral Data**
Adi Daniel, Barak Radomsky and Stanley R. Rotman,
Ben Gurion University, Israel

11:20 - 11:40 **A Multi-Scale Approach for Data Imputation**
Neta Rabin and Dalia Fishelov
Afeka Academic College of Engineering, Israel

11:40 - 12:00 **Signal Processing and Behavior Recognition in Animal Welfare Monitoring System**
Patrick Busch, Frank Stüpmann and Hartmut Ewald,
University of Rostock, Germany

12:00 - 12:20 **Kohonen-Based Topological Clustering as an Amplifier for Multi Class Classification for Parkinson's Disease**
Alex Frid[1], Ohad Mosafi[1] and Larry M. Manevitz[2],
(1) Technion, Israel, (2) University of Haifa, Israel

12:20 - 12:40 **Information Transmission of Thirped Acoustic Signals and Power Transfer In Medical Implants**
Beniamin Kantor, Alex Krichevsky, Yuval Shklarsh and Denis Dikarov
Technion, Israel

Thursday, December 13th, 2018

11:00-13:00	**SX3: Special Session on IT part 2**	**Canaan Hall**

Chair: Or Ordentlich, Hebrew University

11:00 - 11:20 **Analog Coding and Good Frames**
Ram Zamir,
Tel Aviv University, Israel

11:20 - 11:40 **Achieving the Expurgated Exponent with Recursive Cost-Constrained Coding**
Anelia Somekh-Baruch, BIU, Israel, Jonathan Scarlett, *NUS, Singapore* and Albert Guillen i Fabregas,
Universitat Pompeu Fabra, Spain

11:40 - 12:00 **Information and Uncertainty in Learning: Know When you do not Know**
Meir Feder,
Tel Aviv University, Israel

12:00 - 12:20 **From two to thousands: Optimal Maxing, Ranking, and Preference Learning**
Alon Orlitsky,
UCSD, USA

12:20 - 12:40 **Matrix Entropy-Power Inequality via Normal Transport**
Olivier Rioul, *Télécom ParisTech, France,* Ram Zamir
Tel Aviv University, Israel

12:40 - 13:00 **Sub-string matching in sub-linear time using sparse Fourier Transforms**
N.T. Janakiraman, A. Vem, K.R. Narayanan
and J.-F. Chamberland
Texas A&M, USA

11:00-13:00	POW1: Power 1: Power Electronics	Ophir Hall
	Chair: Alon Kuperman, Ben Gurion University	

11:00 - 11:20 **Voltage-Dependent-Capacitor Control of Wireless Power Transfer (WPT)**
Sahar Borafker, Miriam Drujin and Sam Ben-Yaakov,
Ben Gurion University, Israel

11:20 - 11:40 **Moderate Constant Power Properties of Series Resonant Networks**
Sam Ben-Yaakov,
Ben Gurion University, Israel

11:40 - 12:00 **Control Performance Analysis of Current-Mode-Buck-Converter Interfaced Photovoltaic Generator**
Moshe Sitbon and Ilan Aharon,
Ariel University, Israel

12:00 - 12:20 **Keeping a Circuit in Resonance by Impedance Modification**
Yotam Frechter[1], Arthur Shoihet[2] and Alon Kuperman[1]
Ben-Gurion University, Israel (2) Nuclear Research Center of Negev, Israel

12:20 - 12:40 **Linear Approximation of Transient Process in R-C Circuit Fed by Power Source**
Oz Sorkin, Eliyahu Farber and Moshe Averbukh
Ariel University, Israel

12:40 - 13:00 **Modeling of Electromagnetic Levitation Melting System with Experimental   Validation**
Idan Sassonker, Moshe Shvartsas, Arthur Shoihet and Alon Kuperman
Ben Gurion University, Israel

Thursday, December 13th, 2018

11:00-12:40	**COM2: Communication 2**	**Eden Hall**
	Chair: Itsik Bergel, Bar Ilan University	

11:00 - 11:20   **On the Optimal Routing Based on Partial CSI in MIMO Random Ad-hoc Networks**
Yiftach Richter and Itsik Bergel,
Bar Ilan University, Israel

11:20 - 11:40   **Probability Based Keys Sharing for IOT Security**
Guy Leshem, Esther David and Menachem Domb
Ashqelon Academic College, Israel

11:40 - 12:00   **Resource Allocation in Wireless Mesh Networks**
Arie Reichman[1], Shahaf Wayer[1] and Miri Priesler[2]
(1) Ariel University, Israel (2) Ruppin Academic Center, Israel

12:00 - 12:20   **Scheduling For 5G Cellular Networks with Priority and Deadline Constraints**
Li-On Raviv, Ido Hadar and Amir Leshem
Bar-Ilan University, Israel

12:20 - 12:40   **Asymptotic Uplink Performance of Multi-Antenna Cellular Networks with Co-Operative Base Stations**
Itsik Bergel[1] and Siddhartan Govindasamy[2]
(1) Bar-Ilan University, Israel (2) F. W. Olin College of Engineering, USA

Session 3:

14:00-16:10	**OPE1: optoelectronics 1**	**Sapphire Hall**
	Chair: Boris Melomed, Tel Aviv University	

14:00 - 14:30   **Photonic Crystal Fano Resonances for Realizing Ultrafast Lasers and Switches**
Jesper Mork, DTU, Denmark

14:30 - 14:50   **Design of Multi-Core Integrated Wavelength-Selective Switch, and its System Benefits**
Miri Blau and Dan Marom
Hebrew University, Israel

14:50 - 15:10   **Fiber-Optic Sensing and Non-Uniform Sampling**
Hari Datta Bhatta, Roy Davidi, Arie Yeredor and Moshe Tur,
Tel-Aviv University, Israel

15:10 - 15:30   **Impact of Joint and Independent Switching Paradigms on Routing Capacity of Contention/-less SDM-ROADM Design**
Abhishek Anchal and Dan M. Marom,
Hebrew University, Israel

15:30 - 15:50   **Third Order Nonlinear Waveguide Nanocomposite Core- Fabrication and Characterization**
Moran Bin Nun, Yedidya Lior and Dan M. Marom
Hebrew University, Israel

15:50 - 16:10   **Enhanced Optical Tunable Excited Capacitor (EOTEC) for Faster Responsivity**
Harel Brestel[1], Zeev Zalevsky[2] and Avi Karsenty[1]
(1) Jerusalem College of Technology, Israel (2) Bar Ilan University, Israel

Thursday, December 13th, 2018

14:00-15:45   **SCN2: Systems and control 2**   **Edom Hall**
Chair: Hugo Guterman, Ben Gurion University

14:00 - 14:15   **Observability Analysis and Observer Design for Boolean Control Networks: A Sub-Optimal Polynomial-Complexity Algorithm**
Eyal Weiss and Michael Margaliot
Tel-Aviv University, Israel

14:15 - 14:30   **Direct Adaptive Control Using a Neuro-evolutionary Algorithm for Vehicle Speed Control**
Oded Yechiel, Gal Israeli and Hugo Guterman
Ben-Gurion University, Israel

14:30 - 14:45   **Characterization of Square Nonsingular Matrices that Satisfy the Cyclic Sign Variation Diminishing Property**
Tsuff Ben Avraham, Guy Sharon, Yoram Zarai and Michael Margaliot,
Tel-Aviv University, Israel

14:45 - 15:00   **Internal Model Based Tracking and Disturbance Rejection for An Unstable Wave Equation**
Hua-Cheng Zhou and George Weiss
Tel-Aviv University, Israel

15:00 - 15:15   **Decentralized Event-Triggered Control of Large-Scale Systems with Saturated Actuators**
Yiftah Kowal, Anton Selivanov and Emilia Fridman
Tel-Aviv University, Israel

15:15 - 15:30   **Robust Vertex-dependant H_∞ Control and Estimation of Discrete-time Uncertain Linear Retarded Systems**
Eli Gershon,
Holon Institute of Technology, Israel

15:30 - 15:45   **A switching Controller for a Class of MIMO bilinear time-delay systems**
Tonametl Sanchez[1], Andrey Polyakov[1], Laurentiu Hetel[2] and Emilia Fridman[3]
(1) INRIA-Lille Nord Europe, France (2) Centre de Recherche en Informatique, Signal et Automatique de Lille, France (3) Tel-Aviv University, Israel

14:00-16:00	IT1: Information theory 1	Canaan Hall
	Chair: Haim Permuter, Ben Gurion University	

14:00 - 14:20 **Parallel Gaussian Channels Corrupted by Independent States with a State-Cognitive Helper**
Michael Dikshtein[1], Ruchen Duan[2], Yingbin Liang[3] and Shlomo Shamai[1]
(1) Technion- Israel (2) Samsung Electronics- USA (3) The Ohio State University-USA

14:20 - 14:40 **Exponent Tradeoff for Hypothesis Testing Over Noisy Channels**
Yuval Kochman[1], Nir Weinberger[2] and Mich'ele Wigger[3]
(1) Hebrew University, Israel (2) Tel-Aviv University, Israel
(3) Teloecom ParisTech, Farnce

14:40 - 15:00 **Broadcasting Information subject to State Masking**
Michael Dikshtein, Shlomo Shamai
Technion, Israel

15:00 - 15:20 **Graph-based Achievable Rate Region for the Two-Way Channel with Common Output**
Oron Sabag, Haim Permuter
Ben-Gurion University, Israel

15:20 - 15:40 **Achievable Rate for Finite State Channel**
Eli Shemuel, Oron Sabag and Haim Permuter
Ben-Gurion University, Israel

15:40 - 16:00 **Secrecy Rates and Outage in Multi-User Multi-Eavesdropper Broadcast Channel**
Joseph Kampeas, Asaf Cohen and Omer Gurewitz
Ben-Gurion University, Israel

Thursday, December 13th, 2018

14:00-16:00	POW2: Power 2	Ophir Hall
	Chair: Yoash Levron, Technion	

14:00 - 14:20 **Preliminary Magnetic Energy Considerations in a Relativistic Engine: Mutual Inductance vs. Kinetic Terms**
Asher Yahalom,
Arie University, Israel

14:20 - 14:40 **Electrification Israel Railroads: Network Frequency Instability and Challenges of Distribution Voltage Control**
Igal Goldshtein[1] and Moshe Averbukh[2]
(1) Israel Electric Company, Israel (2) Ariel University, Israel

14:40 - 15:00 **Effect of Load Composition on the Frequency Response of the Cyprus Power System**
Elena Polykarpou, Markos Asprou, Elias Kyriakides, Christos Hadjilaou, Andreas Petoussis and Zenon Achillides
(1) University of Cyprus, Cyprus (2) Transmission System Operator of Cyprus-Cyprus (3) Electricity Authority of Cyprus, Cyprus

15:00 - 15:20 **Optimal Deployment of DG and DSTATCOM in Distribution System using Swarm Intelligent Techniques**
Srinivas Nagaballi and Vijay Kale
Visvesvaraya National Institute of Technology, India

15:20 - 15:40 **Duality Principle Approach to Multilevel Three-Phase Current**
Kfir J. Dagan
Ben-Gurion University, Israel

15:40 - 16:00 **Model Predictive Direct Power Control of Four-Switch-Based Inverter Connected to Unbalanced Grid System**
Martin Cernan, Miroslav Müller, Zdenek Müller, Josef Tlustý and Viktor Valouch
Czech Technical University, Czechia

Thursday, December 13th, 2018

14:00-15:45	**ED1: Electronic devices 1**	**Eden Hall**

Chair: Gady Golan, Ariel University

14:00 - 14:15 **Novel reliability model for GaN power FET**
Gady Golan, Moshe Azoulay, Joseph Bernstein, Tsuriel Avraham and
Ilan Kremenetsky
Ariel University, Israel

14:15 - 14:30 **Novel Approach of Backside Lithography Using Dynamic Magnetic Mask**
Amos Bardea
Holon Institute of Technology, Israel

14:30 - 14:45 **Polarization Controlled Emission on Plasmonic Nanogrooves**
Shmuel Sternklar, Rajesh Desapogu, Ziv Glasser, Yuri Gorodetski and
Dima Cheskis
Ariel University, Israel

14:45 - 15:00 **DC Low Current Hall Effect Measurements**
Dima Cheskis[1], Yannai Namia-Cohen[1], Yossi Sharon[1] and Bagrat Khachatryan[2]
(1)Ariel University, Israel (2) Technion , Israel

15:00 - 15:15 **1×4 Visible Light MMI Wavelength Demultiplexer in GaN Slot-Waveguide Structure**
Dror Malka
Holon Institute of Technology, Israel

15:15 - 15:30 **2D Materials Electronics**
Doron Naveh
Bar-Ilan University, Israel

15:30 - 15:45 **Switched-Capacitor RF Power Amplifiers: A Review**
Nimrod Ginzberg and Emanuel Cohen
Technion, Israel

Thursday, December 13th, 2018

Session 4:

16:20-18:20	OPE2: Electro-optic 2	Sapphire Hall
	Chair: Dan Marom, Hebrew University	

16:20 - 16:35 **Snapshot Spectral and Color Imaging Using Monochromatic Camera with Optical Diffuser and Compressed Sensing Algorithm**
Jonathan Hauser, Valery Zheludev, Michael Golub, Amir Averbuch and Menachem Nathan,
Tel Aviv University, Israel

16:35 - 16:50 **A stochastic approach for optimizing the required number of sub-pixels in Silicon Photomultipiler (SiPM) for optical radar applications (LiDAR)**
Ayal Eshkoli and Yael Nemirovsky,
Technion, Israel

16:50 - 17:05 **Deep Learning Approaches for Unwrapping Phase Images with Steep Spatial Gradients**
Gili Dardikman, Nir Turko and Natan Shaked
Tel Aviv University, Israel

17:05 - 17:20 **Slit NSOM Imaging using Nanoscale Photodetector**
Matityahu Karelits[1], Yaakov Mandelbaum[1], Avraham Chelly[2] and Avi Karsenty[1]
(1) Jerusalem College of Technology, Israel (2) Bar Ilan University, Israel

17:20 - 17:35 **Analysis of White Light Speckle Imaging**
Moran Davoodi, Yaakov Buchris and Israel Cohen
Technion, Israel

17:35 - 17:50 **Polarization Controlled Emission on Plasmonic Nanogrooves**
Shmuel Sternklar, Rajesh Desapogu, Ziv Glasser, Yuri Gorodetski and Dima Cheskis
Ariel University, Israel

17:50 - 18:05 **Bloch Oscillations of Electrons Dressed with Photons: Theory and Potential Applications in Nanoelectronics**
Ilay Levie and Gregory Slepyan
Tel Aviv University, Israel

18:05 - 18:20 **General Analytical Coupled-mode Solution of Multiwaveguide Systems**
Nitzan Shitrit, Vladislav Shteeman and Amos Hardy
Tel Aviv University, Israel

16:20-18:00	**SCN3: Systems and Control 3**	**Edom Hall**
	Chair: Uri Shaked	

16:20 - 16:40 **Least-Square Batch Filtering for The Case of Bounded Measurement Errors**
Martin Weiss[1], Tal Shima[1] and Ilan Rusnak[2]
(1) Technion, Israel (2) RAFAEL, Israel

16:40 - 17:00 **Minimum Effort Guidance with Delayed Engagement Resolution**
Vladimir Turetsky[1], Martin Weiss[2] and Tal Shima[2]
(1) Ort Braude College, Israel (2) Technion, Israel

17:00 - 17:20 **Optimal Control of Stochastic/Noisy Linear System with Prescribed Convergence Rate**
Ilan Rusnak,
RAFAEL, Israel

17:20 - 17:40 **On Correcting Customary Misuses of Limits and Derivatives and Eliminating Their Negative Impact on Nonlinear Systems Stability Analysis**
Itzhak Barkana
Bakana Consulting, Israel

17:40 - 18:00 **Comparison of RNLS, EKF and SDDRE Filters of Nonlinear Dynamic System**
Liat Peled-Eitan and Ilan Rusnak
RAFAEL, Israel

Thursday, December 13th, 2018

16:20 - 18:00	**IT2: Information Theory 2**	**Canaan Hall**

Chair: Ram Zamir, Tel Aviv University

16:20 - 16:40   **Differential Entropy Estimation under Gaussian Noise**
Ziv Goldfeld[1], Kristjan Greenewald[2], Yury Polyanskiy[1] and Yihong Wu[3]
MIT- USA (2) IBM Cambridge Research Center- USA (3) Yale University-USA

16:40 - 17:00   **Coding for Noncausal Tracking**
Robert Graczyk and Amos Lapidoth
ETH Zurich, Switzerland

17:00 - 17:20   **Rate vs. Covertness for the Packet Insertion Problem**
Tsvi Dvorkind[1] and Asaf Cohen[2]
(1) RAFAEL- Israel (2) Ben-Gurion University, Israel

17:20 - 17:40   **On Lossy Compression of Generalized Gaussian Sources**
Alex Dytso[1], Ronit Bustin[2], H. Vincent Poor[1] and Shlomo Shamai[2]
Princeton University, USA (2) Technion, Israel

17:40 - 18:00   **Combating Packet Loss in Image Coding using Oversampling and Irregular Interpolation**
Mor Goren and Ram Zamir
Tel-Aviv University, Israel

18:00 - 18:20   **Confidential Communication in C-RAN Systems with Infrastructure Sharing**
Michael Zeyde[1], Osvaldo Simeone[2] and Shlomo Shamai[1]
(1) Technion-Israel (2) King's College London, United Kingdom

16:20-18:20	**POW3: Power 3**	**Ophir Hall**
	Chair: Elias Kyriakides, University of Cyprus	
	Sponsored by: solar edge	

16:20 - 16:40   **Synchronverter Based Photovoltaic Inverter**
Zeev Kustanovich and George Weiss
Tel-Aviv University, Israel

16:40 - 17:00   **Modified Approach for Global MPP Finding under Partial Shading Based on Photo-Current Estimations of Each PV panel**
Asher Yahalom, Tatiana Minav and Moshe Averbukh
Ariel University, Israel

17:00 - 17:20   **Virtual Infinite Capacitor Applied to Dc-Link Voltage Filtering For Wireless Electric Vehicle Chargers**
Vinay Bhus, Jyun Lin and George Weiss
Tel-Aviv University, Israel

17:20 - 17:40   **DC-Link Auxiliary Circuit Implementation to Improve Transient Response of Grid Connected Power Converters**
Martin Mellincovsky, Alon Kuperman and Vladimir Yuhimenko
Ben-Gurion University, Israel

17:40 - 18:00   **A Novel Active Three-Phase Multilevel Power Factor Correction Rectifier - The "Negev" Rectifier**
Eli Barbie, Alon Kuperman and Raul Rabinovici
Ben-Gurion University, Israel

18:00 - 18:20   **Nearest Neighbor MPPT with Cross-Entropy Method optimization - The "Negev" Rectifier**
Ram Machlev and Yoash Levron,
Technion, Israel

Friday, December 14th, 2018

Session 1:

08:30 - 10:10	**COMVI: Computer Vision 1**	**Sapphire Hall**

Chair: Eyal Katz- Afeka College of Engineering

08:30 - 08:50   **Novel Hybrid Fourth-order Anisotropic Diffusion Model for Additive Noise Filtering**
Tudor Barbu,
Institute of Computer Science of the Romanian Academy, Romania

08:50 - 09:10   **Point Target Detection Using Nonnegative Matrix Factorization**
Ira Dayan, Shimrit Maman, Dan Blumberg and Stanley Rotman
Ben-Gurion University, Israel

09:10 - 09:30   **Analysis of Piecewise Fractional Brownian Motion Signals and Textures**
Samah Khawaled, Ido Zachevsky and Yehoshua Y. Zeevi
Technion, Israel

09:30 - 09:50   **Face Anti-Spoofing Based on Projective Invariants**
Alexander Naitsat and Yehoshua Zeevi,
Technion, Israel

09:50 - 10:10   **Covert Channel Cyber-attack based on Watermarking in the DCT domain**
Ofer Hadar and Yoram Segal
Ben Gurion University, Israel

08:30-10:30	**SX1: Special Session on speech Processing**	**Opal Hall**

Chair: Sharon Gannot, Bar-Ilan University
Organizers: Sharon Gannot, Bar-Ilan University, Boaz Rafaely,
Ben Gurion University

08:30 -08:50   **Broadband Superdirective Beamforming with a Random Steering Vector**
Xianghui Wang[1], Jacob Benesty[2], Israel Cohen[3] and Jingdong Chen[1]
(1) CIAIC and School of Marine Science and Technology, Northwestern Polytechnical University-China (2) INRS-EMT, University of Quebec, Canada (3) Technion, Israel

08:50 - 09:10   **On the Difference-to-Sum Power Ratio of Speech and Wind Noise Based on the Corcos Model**
Daniele Mirabilii and Emanuël Habets
International Audio Laboratories Erlangen, Germany

09:10 - 09:30   **Speech Enhancement with Deep Neural Networks Using Mixture of Gaussians Based Labels**
Hodaya Hammer, Gilad Rath, Shlomo E. Chazan, Jacob Goldberger and Sharon Gannot
Bar-Ilan University, Israel

09:30 - 09:50   **Joint Estimation of RETFs and PSDs for a Moving Speaker Based on Alternating Least Squares**
Marvin Tammen[1], Ina Kodrasi[2] and Simon Doclo[1]
(1) University of Oldenburg, Germany (2) Idiap Research Institute, Switzerland

09:50 - 10:10   **A Bayesian Hierarchical Model for Speech Dereverberation**
Yaron Laufer and Sharon Gannot
Bar-Ilan University, Israel

10:10 - 10:30   **Speaker Separation Using A Convolutional Autoencoder**
Mohamed Asni, Daniel Shapiro, Tony Mathew, Miodrag Bolic and Leor Grebler
University of Ottawa, Canada

Friday, December 14th, 2018

08:30-10:30	**CP2: Computers 2**	**Edom Hall**

Chair: Mark Shifrin, Ben Gurion University

08:30 - 08:50   **NVDIMM-N Persistent Memory and its Impact on Two Relational Databases**
Netanel Katzburg, Amit Golander and Shlomo Weiss
(1) NetApp, Israel (2) Tel-Aviv University, Israel

08:50 - 09:10   **A Reconfigurable ASIP for 802.11 Packet Detection Algorithm**
Refael Avez and Shlomo Weiss
Tel-Aviv University, Israel

09:10 - 09:30   **Persistent Memory Based and Feature Rich File System Design**
Amit Golander and Netanel Katzburg
NetApp, Israel

09:30 - 09:50   **A Dual-Negative Word-Line Technique for Improving Read Access in GC-eDRAM Arrays**
Roman Golman, Robert Giterman and Adam Teman
Bar-Ilan University, Israel

09:50 - 10:10   **Transmission Timing on Optical Data-Center RotorNets for Reduced Cost, Energy and Latency**
Yitzhak Birk and Tamir Friedman
Technion, Israel

10:10 -10:30   **Redundancy and Randomization as Effective Tool for Improving Performance**
Yitzhak Birk
Technion, Israel

Friday, December 14th, 2018

08:30-10:30	**ML2: Machine Learning 2**	**Canaan Hall**
	Chair: Eugene Kagan, Ariel University	

08:30 - 08:50   **Subspace Analysis in Multi-Class Datasets: An Application to Novelty**
Detection Ensembles
Marcelo Bacher, Erez Shmueli and Irad Ben-Gal
Tel-Aviv University, Israel

08:50 - 09:10   **Complex-Valued Logic for Neural Networks**
Eugene Kagan[1], Alexander Rybalov[2] and Ronald Yager[3]
*(1)Ariel University , Israel (2) Machine Intelligence Institute & & LAMBDA
Laboratory, Israel (3) Machine Intelligence Institute , Iona College, USA*

09:10 - 09:30   **Ad Placement Mechanism for Public Displays of Private Owners**
Rina Azoulay and Esther David
(1) Jerusalem College of Technology, Israel (2) Ashkelon College, Israel

09:30 - 09:50   **Convergence problems of Mahalanobis distance-based k-means
clustering**
Itshak Lapidot
Afeka Tel-Aviv College of Engineering, Israel

09:50 -10:10   **Enhancing Information Flow of Recurrent Highway Networks**
Ron Shoham and Haim Permuter
Ben Gurion University, Israel

10:10 -10:30   **Improved Training Methods for Recurrent Neural Networks**
Ziv Aharoni, Gal Rattner and Haim Permuter
Ben Gurion University, Israel

08:30-10:30	**EMC1: Antenna and Electromagnetic compatibility 1**	**Ophir Hall**
	Chair: Timor Melamed, Ben Gurion University	
	Power electronics and renewables	

08:30- 08:45 **Wave Phenomena of Plane Wave Scattering by a Moving Circular Cylinder**
Eliran Mizrahi and Timor Melamed
Ben-Gurion University, Israel

8:45 - 09:00 **Thinning Satellite Communication Antenna Arrays for Dual Band Operation**
Rotem Gal and Reuven Shavit
Ben-Gurion University, Israel

09:00- 09:15 **Quantum Antenna as an Open System: Strong Antenna Coupling with Photonic Reservoir**
Alexei Komarov and Gregory Slepyan,
Tel-Aviv University, Israel

09:15- 09:30 **Design and Simulation of a Realtively Flat Four Horn Antenna**
Haim Matzner[1], Ely Levine[2] and Mark Abramov[1]
Holon Institute of Technology, Israel (2) Afeka College of Engineering, Israel

09:30- 09:45 **Efficiency of differential receiving antenna interfaced to a three-port network**
Vladimir Vulfin[1], Nastya Verhovsky[1] and Reuven Ianconescu[2]
(1) EM INFINITY-Israel (2) Shenkar College of Engineering and Design-Israel

09:45 - 10:00 **Fowler-Nordheim Emission in the THz Hybrid Cavity**
Miron Voin and Levi Schachter
Technion, Israel

10:00 - 10:15 **Approximating the Directivity of Antenna Arrays**
Haim Matzner[1] and Ely Levine[2]
Holon Institute of Technology, Israel (2) Afeka College of Engineering, Israel

Friday, December 14th, 2018

Session 2:

| 11:00-13:20 | **COMVI2: Computer Vision 2** | **Sapphire Hall** |
| | Chair: TBD | |

11:00 - 11:20   **Automatic Hair Colorization Using Chromaticity Distribution Matching**
Uri Lipowezky,
Samsung Electronics, Israel

11:20 - 11:40   **Robust Motion Compensation for Forensic Analysis of Egocentric Video using Joint Stabilization and Tracking**
Oren Cohen[1], Alexander Apartsin[2], Jonathan Alon[2] and Eyal Katz[1]
(1) Afeka College of Engineering, Israel, (2) Motorola Solutions, Israel

11:40 - 12:00   **Low-Complexity Video Classification using Recurrent Neural Networks**
Ifat Abramovich, Tomer Ben Yehuda and Rami Cohen
Technion, Israel

12:00 - 12:20   **Real-time Pedestrian Traffic Light Detection**
Roni Ash, Dolev Ofri, Jonathan Brokman, Idan Friedman and Yair Moshe
Technion, Israel

12:20 - 12:40   **Light Invariant Video Imaging for Underwater Color Correction**
Amir Kolaman, Tal Piterman and Hugo Guterman
Ben-Gurion University, Israel

12:40 - 13:00   **Spatio-Temporal Detection of Cumulonimbus Clouds in Infrared Satellite Images**
Ron Dorfman[1], Etai Wagner[1], Almog Lahav[1], Alon Amar[1], Ronen Talmon[1] and Yaron Halle[2]
(1) Technion, Israel (2) National Research Center, Israel

Friday, December 14th, 2018

| 11:00 - 13:00 | **SX4: Special Session on Deep Learning** | **Topaz Hall** |

Chair: Michael Elad, Technion

11:00 - 11:20   **DNN or k -NN: That is the Generalize vs. Memorize Question**
Gilad Cohen[1], Guillermo Sapiro[2], Raja Giryes[1],
(1) Tel Aviv University, Israel (2) Duke University, USA

11:20 - 11:40   **Low-Cost Parameterizations of Deep Convolution Neural Networks Grade**
Eran Treister[1], Lars Ruthotto Eldad Haber [2]
Ben-Gurion University -Israel of British Columbia-Canada

11:40 - 12:00   **Improved Training methods of Recurrent Neural Networks**
Ziv Aharoni, Gal Ratnner, Haim Permuter
Ben-Gurion University, Israel

12:00 - 12:20   **High Frame-Rate Cardiac Ultrasound Imaging with Deep Learning Grade**
Ortal Senouf [1]; Sanketh Vedula [1]; Grigoriy Zurakhov [1]; Alex Bronstein [1]; Michael
Zibulevsky [1]; Dan Adam [1]; Oleg Michailovich [2]; David S. Blondheim [3]
*(1) Technion- Israel (2) University of Waterloo - Canada (3) Hillel Yaffe Medical
Center, Israel*

12:20 - 12:40   **Classification and Localization in Mammograms via Weakly and Semi
Supervised Deep Learning**
Ran Bakalo[1], Jacob Goldber, Rami Ben-Ari[1]
(1) IBM-Research-Israel (2) Bar Ilan University, Israel

12:40-13:00   **Deep Learning for Transiting Exoplanets Detection**
Elad Dvash, Yam Peleg, Shay Zucker and Raja Giryes,
Tel Aviv University, Israel

11:00-13:00	**SX1: Special Session on speech Processing**	**Opal Hall**

Chair: Sharon Gannot, Bar-Ilan University
Organizers: Sharon Gannot, Bar-Ilan University, Boaz Rafaely,
Ben Gurion University

11:00 - 11:20   **Employing the Turbo Principle for Audiovisual Speech Recognition and Enhancement**
Dorothea Kolossa
Ruhr-Universität Bochum, Germany

11:20 - 11:40   **Speaker Localization using the Direct-Path Dominance Test for Arbitrary Arrays**
Hanan Beit-On and Boaz Rafaely,
Ben-Gurion University, Israel

11:40 - 12:00   **Effect of Reverberation in Speech-based Emotion Recognition**
Shujie Zhao, Yan Yang and Jingdong Chen
Northwestern Polytechnical University, China

12:00 - 12:20   **RTF-Based Binaural MVDR Beamformer Exploiting an External Microphone for Dynamic Acoustic Scenarios**
Nico Gößling and Simon Doclo
University of Oldenburg, Germany

12:20 - 12:40   **Speakers Clustering with Stochastic VQ and Clustering Quality Estimator**
Yishai Cohen and Itshak Lapidot
Afeka Tel-Aviv College of Engineering, Israel

12:40 - 13:00   **A Weighted Multichannel Wiener Filter and its Decomposition To LCMV Beamformer and Post-Filter for Source Separation and Noise Reduction**
Aviel Adler[1], Ofer Schwartz[2] and Sharon Gannot[1]
(1) Bar-Ilan University, Israel, (2) CEVA DSP, Israel

Friday, December 14th, 2018

11:00-13:00	**MV: Machine Learning and Vision**	**Canaan Hall**
	Chairs: Amir Averbuch, Tel Aviv University	

11:00 - 11:20 **A Novel Machine Learning Approach to Prevent Illegal Distribution of Screen Captured Videos**
Manikandan V. M. and Masilamani V.,
Indian Institute of Information Technology, India

11:20 - 11:40 **Random Diffusion Representations**
Moshe Salhov and Amir Averbuch,
Tel Aviv University, Israel

11:40 - 12:00 **Deep Learning Approaches for Unwrapping Phase Images with Steep Spatial Gradients: A Simulation Neural Networks**
Gili Dardikman, Nir Turko and Natan Shaked,
Tel Aviv University, Israel

12:00 - 12:20 **Kohonen-Based Topological Clustering as an Amplifier for Multi Class Classification for Parkinson's Disease**
Alex Frid, Ohad Mosafi and Larry M. Manevitz
(1)Technion, Israel (2) Haifa University, Israel

12:20 - 12:40 **Distributed Deep Learning on Wimpy Smartphone Nodes**
Tzoof Hemed, Nitai Lavie and Roman Kaplan,
Technion, Israel

12:40 - 13:00 **Robust Smartphone Mode Recognition**
Itzik Klein[1], Yuval Solaz[2] and Rotem Alaluf[2]
(1) Technion, Israel (2) Rafael, Israel

Short Course on Deep Learning

Wednesday, December 12th, 2018, 13:30

A three hour hands on short course during the conference with Yam Peleg: Yam Peleg is the founder of Deep Trading Ltd, an Israeli based Algorithmic trading firm. He was a quantitative trader and machine-learning researcher for over seven years. He is also a major contributor to the Machine Learning open source community, who spoke at dozens conferences around the world, including PyData, PyCon, SciPy and many more.

The course will cover the following topic:

- Installing Tensorflow & Keras on your machine to setting up environment
- Keras Tensorflow tutorial: Fundamentals
- Understanding Keras Sequential Model
- Solving a linear regression problem with examples
- Solving problems using fully connected networks
- Convolutional Neural networks for image recognition, From LeNet to VGG16 - The Sequential
- networks, Inception V3, Resent - Graph structured networks
- Saving and restoring pretrained models using Keras and transfer learning from pre - trained networks
- Recurrent Neural networks for Natural language processing

2018 ICSEE International Conference on the Science of Electrical Engineering

December 12-14, 2018, Eilat, Israel

ICSEE 2018
Symposia

Special ICSEE 2018 Symposia

08:20 - 13:00	**SY 1: Symposium on Electro-optics**	**Sapphire Hall**
	Organizers: Ady Arie and Gadi Eisenstein	

08:20 - 08:30	Welcome note
	Ady Arie, Tel Aviv University, Gadi Eisenstein, Technion

08:30 - 10:30	**Session 1: Discrete Photonics**

08:30 - 09:10	**Thermodynamics of Nonlinear Multimode Systems**
	Prof. Demetrios Christodoulides,
	CREOL-The College of Optics & Photonics, University of Central Florida

09:10 - 09:50	**Topological Photonics and Topological Insulator Lasers**
	Prof. Moti Segev,
	Technion

9:50 - 10:10	PT- and CP-symmetric solitons in one- and two-dimensional discrete systems
	Prof. Boris Malomed
	Tel Aviv University

10:10 - 10:30	**Reformulation of Coupled-Mode Theory of Parallel Waveguides for Analysis of Arbitrary Beams**
	Nitzan Shitrit, Vladislav Shteeman and Amos Hardy,
	Tel Aviv University

10:30 - 11:00	**Coffee Break**

11:00 - 13:00	**Session 2– Quantum optics**

11:00 - 11:40	**Integrated Quantum Frequency Combs**
	Prof. Roberto Morandotti,
	INRS-EMT, Canada

11:40 - 12:20	**Generation of Multi-Photon States from A Single Photon Source**
	Prof. Hagai Eisenberg,
	The Hebrew University Jerusalem

12:20 - 12:40	**Satellite QKD**
	Shlomi Arnon, BGU

12:40 - 13:00	**Frequency-Domain Stern-Gerlach Effect for Photons**
	Aviv Karnieli and Ady Arie
	TAU

Thursday December, 13th, 2018

11:00-17:40	**SY 2: Symposium on Circuits and Systems**	**Topaz Hall**
	Organizers: Alex Fish and Adam Teman, Bar Ilan University	

11:00 - 11:10	**Welcome note**
	Prof. Alexander Fish, Dr. Adam Teman, Prof. Joseph Shor, Dr. Osnat Keren
	EnICS Labs, Bar-Ilan University

11:10 - 13:00	**Session 1:**

11:10 - 11:40	**Resistor-based Temperature Sensors**
	Prof. Kofi Makinwa,
	TU Delft

11:40 - 12:10	**Quality-Energy Trade-off and Bio-Inspired Electronic Systems**
	Prof. Danilo Demarchi,
	Politechnico di Torino

12:10 - 12:35	**Interconnects in the Sub 10 nm World**
	Prof. Yossi Shaham,
	Tel Aviv University

12:35 - 13:00	**Hardware security - Code-based Architectures for Mitigating Fault Attacks**
	Dr. Osnat Keren,
	EnICS Labs, Bar-Ilan University

13:00-14:00	**Lunch**

14:00 - 14:00	**Session 2**

14:00 - 14:25	**Real Processing-in-Memory using Memristive Memory Processing Unit**
	Prof. Shahar Kvatinsky,
	Technion

14:25 - 14:50	**Reasoning About Formal Knowledge: Jasper Experience**
	Dr. Ziyad Hanna,
	Cadence

14:50 - 15:15	**3D-MUSE Multi Process Sequential Integration**
	Prof. Joachim Rodrigues,
	Lund

15:15 - 15:40	**PVT Compensation and Performance Scaling with Adaptive Body Bias**
	Prof. Andy Burg,
	EPFL

15:40 - 16:00   **Formal Verification of Network-Based Biocomputation Circuits**
Dr. Hillel Kugler, Faculty of Engineering, *Bar-Ilan University*

16:00-16:20   **Coffee Break**

16:20 - 17:40   **Session 3: Students session**

16:20 - 16:35   **A Method to Improve Reliability in 65nm SRAM PUF Array**
Yizhak Shifman,
EnICS Labs, Bar-Ilan University

16:35 - 16:50   **Low-Power Synthesized Wallace Tree Multiplier Implementation Using a Spread and Balanced Full Adder**
Or Maltabashi,
EnICS Labs, Bar-Ilan University

16:50 - 17:05   **Efficiency of Dual Mode Logic in Nano scale Technology Nodes**
Netanel Shavit,
EnICS Labs, Bar-Ilan University

17:05 - 17:20   **A Dual –Negative Word-Line Technique for Improving Read Access in GC-eDRAM Arrays**
Roman Golman,
EnICS Labs, Bar-Ilan University

17:20 - 17:40   **Resistor-Based Thermal Sensors in CMOS Integrated Circuits**
Anatoli Mordakhay,
EnICS Labs, Bar-Ilan University

Thursday December, 13th, 2018

| 08:20- 17:40 | **SY 3: Symposium on Deep Learning** | **Opal Hall** |

Organizers: Michael Elad, Technion and Raja Giryes, Tel Aviv University
Sponsored by: NVIDIA.

| 08:20-08:30 | Welcome note |

Michael Elad, Technion

| **08:30 - 10:30** | **Session 1** |

08:30 - 09:10   Stefano Soatto , UCLA/Amazon

09:10 - 09:30   **High Quality Ultrasonic Multi-line Transmission through Deep Learning**
(Contributed talk 1)
Sanketh Vedula (Technion); Ortal Senouf (Technion); Grigoriy Zurakhov
(Technion); Alex Bronstein (Technion); Michael Zibulevsky (Technion);
Dan Adam (Technion); Oleg Michailovich (University of Waterloo);
Diana Gaitini (Rambam Health Care Campus and Faculty of Medicine,
Technion)

09:30 -09:50   **Model-aware Deep Learning for Clutter Suppression in Contrast-
Enhanced Ultrasounds" (Contributed talk 2)**
Oren Solomon (Technion); Regev Cohen (Technion); Ruud J. G. van Sloun
(Technical University of Eindhoven); Yonina Eldar (Technion)

09:50 - 10:25   **Optimization and Generalization in Deep Learning**
Amir Globerson, TAU

| **10:25-10:55** | **Coffee Break** |

| **10:55 - 13:05** | **Session 2** |

10:55 - 11:30   **Sparse Modeling and Deep Learning**,
Michael Elad (Technion

11:30 - 12:05   **No data? no problem**
Lior Wolf (FAIR/TAU)

12:05 - 12:25   **On the Resistance of Neural Networks to label Noise (Contributed talk 3)**
Amnon Drory (TAU), Oria Ratzon (TAU), Shai Avidan (TAU), Raja Giryes (TAU),
BGU

12:25 - 13:05   **Learning the Invisible**
Gitta Kutyniok (TU Berlin)

Thursday December, 13th, 2018

13:05 - 14:00	**Lunch Break**

14:00 - 16:05	**Session 3**

14:00-14:35   **Information Theory of Deep Learning: What do the Layers of Deep Neural Networks represent?"**
Naftali Tishby (The Hebrew University)

14:35-15:10   **Tradeoffs between speed and accuracy in inverse problems Alex Bronstein**
(Technion)

15:10-15:30   **"Image-To-Image Data Augmentation for a Real-Life Task"(Contributed talk 4)**
Idit Diamant (Yi Technology)*, Oranit Dror (Yi Technology),

15:30-16:05   **Training a Medical Imaging System Based on Small Dataset with Unreliable Labels**
Jacob Goldberger (Bar Ilan University)

16:05-16:30	**Coffee Break**

16:30 - 17:40	**Session 4**

16:30 - 17:05   **Improving Training Efficiency in Deep Learning**
Daniel Soudry (Technion)

17:05 - 17:25   **Towards Real-time Video Object Segmentation** (Contributed talk 5)
Gilad Sharir (Alibaba Group)*; Nadav Zamir (Alibaba Group); Ilan Schvartzman (Aalibaba group); Eyal Madar (Alibaba group); Albert Achtenberg (Alibaba group); Eduard Smolyansky (Alibaba Group),

17:25 - 17:40   **NVIDIA**

About the invited speakers:

Prof. Gitta Kutyniok - TU-Berlin

Bio: Gitta Kutyniok currently holds an Einstein Chair at the Technische Universität Berlin and is head of the Applied Functional Analysis Group. She received her Diploma in Mathematics and Computer Science as well as her Ph.D. degree from the Universität Paderborn in Germany, and her Habilitation in Mathematics in 2006 at the Justus-Liebig Universität Gießen. From 2001 to 2008 she held visiting positions at several US institutions, including Princeton University, Stanford University, Yale University, Georgia Institute of Technology, and Washington University in St. Louis. In 2008, she became a full professor of mathematics at the Universität Osnabrück, and moved to Berlin three years later.

She received a research award from the Universität Paderborn in 2003, the Research Prize of Gießen and a Heisenberg-Fellowship in 2006, the von Kaven Prize by the DFG in 2007, and an Einstein Chair in 2008. She gave the Noether Lecture at the ÖMG-DMV Congress in 2013 and the Hans Schneider ILAS Lecture at IWOTA in 2016, and became a member of the Berlin-Brandenburg Academy of Sciences and Humanities in 2017. She is Scientific and Executive Director of the graduate school BIMoS and Chair of the SIAM Activity Group on Imaging Sciences. Her main research interests are in the areas of applied harmonic analysis, compressed sensing, deep learning, imaging science, high-dimensional data analysis, inverse problems, and applications to life sciences and telecommunication."

Prof. Stefano Soatto - UCLA

Bio: Professor Soatto received his Ph.D. in Control and Dynamical Systems from the California Institute of Technology in 1996; he joined UCLA in 2000 after being Assistant and then Associate Professor of Electrical and Biomedical Engineering at Washington University, and Research Associate in Applied Sciences at Harvard University. Between 1995 and 1998 he was also Ricercatore in the Department of Mathematics and Computer Science at the University of Udine - Italy. He received his D.Ing. degree (highest honors) from the University of Padova- Italy in 1992.

His general research interests are in Computer Vision and Nonlinear Estimation and Control Theory. In particular, he is interested in ways for computers to use sensory information (e.g. vision, sound, touch) to interact with humans and the environment.

Dr. Soatto is the recipient of the David Marr Prize (with Y. Ma, J. Kosecka and S. Sastry of U.C. Berkeley) for work on Euclidean reconstruction and reprojection up to subgroups. He also received the Siemens Prize with the Outstanding Paper Award from the IEEE Computer Society for his work on optimal structure from motion (with R. Brockett of Harvard). He received the

National Science Foundation Career Award and the Okawa Foundation Grant. He is Associate Editor of the IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) and a Member of the Editorial Board of the International Journal of Computer Vision (IJCV) and Foundations and Trends in Computer Graphics and Vision.

Prof. Lior Wolf - Facebook/Tel Aviv University

Bio: Prof. Wolf is a research scientist in Facebook AI Research (FAIR) and a full professor at the School of Computer Science at Tel-Aviv University. Prof. Wolf's work has received several awards including the best paper awards at ICANN'16 and at the CVPR'13 workshop on action recognition.

Prof. Wolf has extensive experience in forming, advising and heading R&D at multiple computer vision startups and his research focuses on computer vision and deep learning and includes topics such as face identification, document analysis, natural language processing, digital paleography, and video action recognition.

Prof. Naftali Tishbi - The Hebrew University

Bio: Dr. Naftali Tishby is a professor of Computer Science, and the incumbent of the Ruth and Stan Flinkman Chair for Brain Research at the Edmond and Lily Safra Center for Brain Science (ELSC) at the Hebrew University of Jerusalem. He is one of the leaders of machine learning research and computational neuroscience in Israel and his numerous ex-students serve at key academic and industrial research positions all over the world. Prof. Tishby was the founding chair of the new computer-engineering program, and a director of the Leibnitz research center in computer science, at the Hebrew university. Tishby received his PhD in theoretical physics from the Hebrew university in 1985 and was a research staff member at MIT and Bell Labs from 1985 and 1991. Prof. Tishby was also a visiting professor at Princeton NECI, University of Pennsylvania, UCSB, and IBM research.

His current research is at the interface between computer science, statistical physics, and computational neuroscience. He pioneered various applications of statistical physics and information theory in computational learning theory. More recently, he has been working on the foundations of biological information processing and the connections between dynamics and information. He has introduced with his colleagues new theoretical frameworks for optimal adaptation and efficient information representation in biology, such as the Information Bottleneck method and the Minimum Information principle for neural coding.

Prof. Jacob Goldberger - Bar Ilan University

Bio: Jacob Goldberger received the Ph.D. degree in 1998 from Tel-Aviv University, Israel, in electrical engineering. He was a post-doctoral fellow in the computer vision group at the Weizmann institute and latter he was a post doctoral fellow in the machine learning group at the University of Toronto. In 2004 he joined the engineering faculty at Bar-Ilan University where he is now an associate professor. His research deals with developing and analyzing efficient statistical algorithms for learning and inference in the context of classical machine learning tasks such as classification, clustering and embedding and applying these algorithms to a large variety of applications such as computer vision, speech processing, medical imaging and natural language processing. In recent years his research is focused on addressing these challenges in the context of deep learning.

Prof. Alex Bronstein - Technion

Bio: Alex Bronstein is an associate professor of computer science at the Technion – Israel Institute of Technology a principal engineer at Intel Corporation. His research interests include numerical geometry, computer vision, and machine learning. Prof. Bronstein has authored over 100 publications in leading journals and conferences, over 30 patents and patent applications, the research monograph "Numerical geometry of non-rigid shapes", and edited several books. Highlights of his research were featured in CNN, SIAM News, Wired. Prof. Bronstein is a Fellow of the IEEE for his contribution to 3D imaging and geometry processing. In addition to his academic activity, he co-founded and served as Vice President of technology in the Silicon Valley start-up company Novafora (2005-2009), and was a co-founder and one of the main inventors and developers of the 3D sensing technology in the Israeli startup Invision, subsequently acquired by Intel in 2012. Prof. Bronstein's technology is now the core of the Intel RealSense 3D camera integrated into a variety of consumer electronic products. He is also a co-founder of the Israeli video search startup Videocites where he serves as Chief Scientist.

Prof. Amir Globerson - Tel Aviv University

Bio: Prof. Globerson received his BSc in computer science and physics in 1997 from the Hebrew University, and his PhD in computational neuroscience from the Hebrew University in 2006. After his PhD, he was a postdoctoral fellow at the University of Toronto and a Rothschild postdoctoral fellow at MIT. He joined the Hebrew University school of computer science in 2008, and moved to the Tel Aviv University School of Computer Science in October 2015. His research interests include machine learning, probabilistic inference, optimization, neural computation and natural language processing. He is an Associate Editor in Chief for the IEEE

Transactions on Pattern Analysis and Machine Intelligence, and program co-chair of the UAI 2018 conference. His work has received several prizes including five paper awards (at NIPS, UAI, and ICML).

Prof. Daniel Soudry - Technion

Bio: Since October 2017, Daniel Soudry is an assistant professor (Taub Fellow) in the Department of Electrical Engineering at the Technion, working in the areas of machine learning and theoretical neuroscience. Before that, he did his post-doc (as a Gruss Lipper fellow) working with Prof. Liam Paninski in the Department of Statistics, the Center for Theoretical Neuroscience the Grossman Center for Statistics of the Mind at Columbia University. He did his Ph.D. in the Department of Electrical Engineering at the Technion, Israel Institute of technology, under the guidance of Prof. Ron Meir. He received his B.Sc. degree in Electrical Engineering and Physics from the Technion.