

## Detailed Technical Program

Oral presentations: 20 minutes each, 15-18 minutes presentation + 2-5 minutes Q&A.

Poster Presentations: The size of the poster-boards is 0.9m (width) by 1.5m (height). Please let us know in case you require any special equipment for your poster presentations (earphones will be available in the "Audio Day").

Spotlight presentations: These are 2-minutes "promos" for some of the papers to be presented in the subsequent poster sessions. A spotlight presentation consists of 2-3 slides, possibly with a short audio or video clip, where applicable.

### Monday, March 12<sup>th</sup>

19:00-21:00 **Welcome Reception**

### Tuesday, March 13<sup>th</sup>

09:00-09:15 **Opening Remarks**

09:15-10:15 **Keynote Talk I**

**The Analysis Sparse Model - Definition, Pursuit, Dictionary Learning, and Beyond**

*Session Chair: **Michael Zibulevsky***

**Michael Elad**, Technion, Israel Institute of Technology (Israel)

10:15-10:30 **Coffee Break**

10:30-12:30 **Oral Session (OS1)**

**Sparsity, Sparse Coding and Dictionary Learning I**

*Session Chair: **Christian Jutten***

10:30-10:50

*Some uniqueness results in sparse convolutive source separation*

**Sudhakar, Prasad; Benichoux, Alexis; Bimbot, Frederic; Gribonval, Rémi**

10:50-11:10

*Separation of Sparse Signals in Overdetermined Linear-quadratic Mixtures*

**Duarte, Leonardo; Attux, Romis; Ando, Rafael; Deville, Yannick; Jutten, Christian**

11:10-11:30

*Regularized Sparse Representation for Spectrometric Pulse Separation and Counting Rate Estimation*

**Trigano, Tom; Sepulcre, Yann**

11:30-11:50

*Convolutive underdetermined source separation through weighted Interleaved ICA and spatio-temporal source correlation*

**Nesta, Francesco; Omologo, Maurizio**

11:50-12:10

*Ternary Sparse Coding*

**Exarchakis, Georgios; Lücke, Jörg; Eggert, Julian; Henniges, Marc**

12:10-12:30

*Dictionary Learning with Large Step Gradient Descent for Sparse Representations*

**Mailhe, Boris; Plumbley, Mark D.**

12:30-13:45 **Lunch Break**

(lunch served on-site)

13:45-14:45	<b>Keynote Talk II</b>	<p><b>Block Component Analysis, a New Concept for Blind Source Separation</b>  <i>Session Chair: <b>Fabian Theis</b></i></p> <p><b>Lieven De Lathauwer</b>, Katholieke Universiteit, Leuven (Belgium)</p>
14:45-16:15	<b>Oral Session (OS2)</b>	<p><b>The 2011 Signal Separation Evaluation Campaign (SiSEC2011) - I</b>  <i>Session Chair: <b>Shoko Araki</b></i></p>
14:45-15:05		<p><i>SiSEC2011 Overview: Audio source separation</i>  <b>Araki, Shoko; Nesta, Francesco; Vincent, Emmanuel; Koldovsky, Zbynek; Nolte, Guido; Ziehe, Andreas; Benichoux, Alexis</b></p>
15:05-15:25		<p><i>SiSEC2011 Overview: Biomedical Data Analysis</i>  <b>Nolte, Guido; Lutter, Dominik; Ziehe, Andreas; Nesta, Francesco; Vincent, Emmanuel; Koldovsky, Zbynek; Benichoux, Alexis; Araki, Shoko</b></p>
15:25-15:45		<p><i>Improved perceptual metrics for the evaluation of audio source separation</i>  <b>Vincent, Emmanuel</b></p>
15:45-15:55		<p><b>Spotlight Presentations:</b>  <i>Musical Audio Source Separation Based on User-Selected F0 Track</i>  <b>Durrieu, Jean-Louis; Thiran, Jean-Philippe</b>  <i>A GMM Sound Source Model for Blind Speech Separation in Under-determined Conditions</i>  <b>Hirasawa, Yasuharu; Yasuraoka, Naoki; Takahashi, Toru; Ogata, Tetsuya; Okuno, Hiroshi G.</b>  <i>Model-driven Speech Enhancement for Multisource Reverberant Environment</i>  <b>Mowlae, Pejman; Martin, Rainer; Saeidi, Rahim</b>  <i>Semi-Blind Source Separation Based on ICA and Overlapped Speech Detection</i>  <b>Koldovsky, Zbynek; Tichavsky, Petr; Malek, Jiri</b>  <i>Nonparametric modelling of ECG: Applications to denoising and to single sensor fetal ECG extraction</i>  <b>Rivet, Bertrand; Niknazar, Mohammad; Jutten, Christian</b></p>
15:55-16:15		<p>Panel Discussion  <i>Panelists: <b>Shoko Araki, Francesco Nesta and Guido Nolte</b></i></p>
16:15-16:30	<b>Coffee Break</b>	
16:30-18:30	<b>Poster Sessions (PS1) PS1a</b>	<p><b>Sparsity, Sparse Coding and Dictionary Learning II</b>  <i>Group Polytope Faces Pursuit for recovery of block-sparse signals</i>  <b>Gretsistas, Aris; Plumbley, Mark D.</b>  <i>Closed-form EM for Sparse Coding and its Application to Source Separation</i>  <b>Sheikh, Abdul-Saboor; Lücke, Jörg</b>  <i>Collaborative Filtering via Group-Structured Dictionary Learning</i>  <b>Szabó, Zoltán; Lórinicz, András; Póczos, Barnabás</b>  <i>Bayesian fuzzy clustering of colored graphs</i>  <b>Theis, Fabian</b></p>

**PS1b****The 2011 Signal Separation Evaluation Campaign (SiSEC2011) - II**

*Musical Audio Source Separation Based on User-Selected F0 Track*

**Durrieu, Jean-Louis; Thiran, Jean-Philippe**

*A GMM Sound Source Model for Blind Speech Separation in Under-determined Conditions*

**Hirasawa, Yasuharu; Yasuraoka, Naoki; Takahashi, Toru; Ogata, Tetsuya; Okuno, Hiroshi G.**

*Model-driven Speech Enhancement for Multisource Reverberant Environment*

**Mowlae, Pejman; Martin, Rainer; Saeidi, Rahim**

*Semi-Blind Source Separation Based on ICA and Overlapped Speech Detection*

**Koldovsky, Zbynek; Tichavsky, Petr; Malek, Jiri**

*Nonparametric modelling of ECG: Applications to denoising and to single sensor fetal ECG extraction*

**Rivet, Bertrand; Niknazar, Mohammad; Jutten, Christian**

**PS1c****Complex-Valued and Qubit Sources**

*Cramér-Rao bound for circular complex independent component analysis*

**Loesch, Benedikt; Yang, Bin**

*Complex Non-orthogonal Joint Diagonalization based on LU and LQ Decompositions*

**Gong, Xiao-Feng; Wang, Ke; Lin, Qiu-Hua**

*Exact and approximate quantum independent component analysis for qubit uncoupling*

**Deville, Yannick; Deville, Alain**

*A Matrix Joint Diagonalization Approach for Complex Independent Vector Analysis*

**Shen, Hao; Kleinstuber, Martin**

*Algebraic Solutions to Complex Blind Source Separation*

**Shen, Hao; Kleinstuber, Martin**

*On the separation performance of the Strong Uncorrelating Transformation when applied to generalized covariance and pseudo-covariance matrices*

**Yeredor, Arie**

**PS1d****Late-Breaking / Demo**

*Efficient Time-Frequency Methods for Multichannel Enhancement of Real-World Signals*

**Mustière, Frederic; Bouchard, Martin; Najaf-Zadeh Hossein; Ramin Pichevar; Thibault, Louis**

*BSS Estimation of Components in DOSY NMR Spectroscopy*

**Toumi, Ichrak; Caldarelli, Stefano; Torrèسانی, Bruno**

*Blind Source Separation of Underdetermined Time/Position Varying Mixtures (withdrawn)*

**Michael, Yotam; Zeevi, Yehoshua Y.**

*Multi-way modeling of EEG to evaluate the treatment effect of Methylphenidate (Concerta®) on adult patients with ADHD*

**Spanier, Assaf; Gal, Noga; Shani-HersHKovitch, Revital; Reches, Amit; Ziv, Keren; Hammerness, Paul; Surman, Craig; Meller, Benjamin; Biederman, Joseph; Deouell, Leon; Geva, Amir**

## Wednesday, March 14<sup>th</sup>

09:00-10:00	<b>Keynote Talk III</b>	<b>The Applications of Tensor Factorization in Inference, Clustering, Graph Theory, Coding and Visual Representations</b> <i>Session Chair: <b>Arie Yeredor</b></i>  <b>Amnon Shashua</b> , Hebrew University of Jerusalem (Israel)
10:00-10:15	<b>Coffee Break</b>	
10:15-12:15	<b>Oral Session (OS3)</b>	<b>Matrix and Tensor Factorization</b> <i>Session Chair: <b>Lieven De Lathauwer</b></i>
10:15-10:35		<i>A Novel Tensor Decomposition To Reveal Replicating Structures In Multiway Data</i> <b>Phan, Anh Huy; Matsuoka, Kiyotoshi; Mandic, Danilo; Tichavsky, Petr; Cichocki, Andrzej</b>
10:35-10:55		<i>Nonnegative Matrix Factorization via Generalized Product Rule and its Application for Classification</i> <b>Fujimoto, Yu; Murata, Noboru</b>
10:55-11:15		<i>Nesterov's Iterations for NMF-based Supervised Classification of Texture Patterns</i> <b>Zdunek, Rafal; He, Zhaoshui</b>
11:15-11:35		<i>Detection of Aliasing in Image Sequences Using Nonlinear Factor Analysis</i> <b>Douglas, Scott</b>
11:35-11:55		<i>Geometrical method using Simplicial Cones for Overdetermined Nonnegative Blind Source Separation: Application to real PET images</i> <b>Ouedraogo, Wendyam Serge Boris; Jutten, Christian; Jaidane, Meriem; Souloumiac, Antoine</b>
11:55-12:15		<i>Multi-domain Feature of an Event-related Potential (ERP) Extracted by Nonnegative Tensor Factorization from EEG Collected at the ERP's Typical Electrodes</i> <b>Cong, Fengyu; Cichocki, Andrzej; Ristaniemi, Tapani; Hietanen, Jari K.; Zhao, Qibin; Astikainen, Piia; Phan, Anh Huy</b>
12:15-13:30	<b>Lunch Break</b>	(lunch served on-site)
13:30-15:00	<b>Oral Session (OS4)</b>	<b>Theory I</b> <i>Session Chair: <b>Paris Smaragdis</b></i>
13:30-13:50		<i>Online PLCA for Real-time Semi-supervised Source Separation</i> <b>Duan, Zhiyao; Mysore, Gautham J.; Smaragdis, Paris</b>
13:15-14:10		<i>Causal Discovery for Linear Non-Gaussian Acyclic Models in the Presence of Latent Gaussian Confounders</i> <b>Chen, Zhitang; Chan, Laiwan</b>
14:10-14:30		<i>Simultaneous diagonalization of skew-symmetric matrices in the symplectic group</i> <b>Meinecke, Frank C.</b>
14:30-14:50		<i>Partially linear estimation with application to image deblurring using blurred/noisy image pairs</i> <b>Michaeli, Tomer; Sigalov, Daniel; C. Eldar, Yonina</b>

14:50-15:00

### **Spotlight Presentations:**

*An algebraic method for approximate rank one factorization of rank deficient matrices*

**Ziehe, Andreas; Kiraly, Franz; Mueller, Klaus-Robert**

*On Computation of Approximate Joint Block-Diagonalization using Ordinary AJD*

**Tichavsky, Petr; Koldovsky, Zbynek; Yeredor, Arie**

*New Online-EM algorithms for general Hidden Markov models. Application to the SLAM problem*

**Le Corff, Sylvain; Fort, Gersende; Moulines, Eric**

*The role of whitening for separation of synchronous sources*

**Almeida, Miguel; Bioucas Dias, José; Vigário, Ricardo**

*To infinity and beyond: On ICA over Hilbert spaces*

**Gutch, Harold; Theis, Fabian**

15:00-15:15

### **Coffee Break**

15:15-17:00

### **Poster Sessions (PS2) PS2a**

#### **Methods and Applications**

*An algebraic method for approximate rank one factorization of rank deficient matrices*

**Ziehe, Andreas; Kiraly, Franz; Mueller, Klaus-Robert**

*A Canonical Correlation Analysis Based Method for improving BSS of Two Related Data Sets*

**Karhunen, Juha; Ylipaavalniemi, Jarkko; Hao, Tele**

*A Probability-Based Combination Method for Unsupervised Clustering with Application to Blind Source Separation*

**Becker, Julian Mathias; Spiertz, Martin; Gnann, Volker**

*The use of Linear Feature Projection for Precipitation Classification using Measurements from Commercial Microwave Links*

**Cherkassky, Dani; Messer, Hagit; Ostrometzky, Jonatan**

*Charrelation Matrix Based ICA*

**Slapak, Alon; Yeredor Arie**

### **PS2b**

#### **Non-negative Matrix Factorization and Applications**

*Bayesian inference of latent causes in gene regulatory dynamics*

**Hug, Sabine; Theis, Fabian**

*Bayesian non-negative matrix factorization with learned temporal smoothness priors*

**Burred, Juan Jose; Coic, Mathieu**

*On Connection Between the Convolutional and Ordinary Nonnegative Matrix Factorizations*

**Phan, Anh Huy; Koldovsky, Zbynek; Tichavsky, Petr; Cichocki, Andrzej**

### **PS2c**

#### **Theory II**

*Alleviating the influence of weak data asymmetries on Granger-causal analyses*

**Haufe, Stefan; Nikulin, Vadim V; Nolte, Guido**

*Contrast Functions for Independent Subspace Analysis*

**Palmer, Jason; Makeig, Scott**

*Distributional Convergence of Subspace Estimates in FastICA: A Bootstrap Study*

**Ylipaavalniemi, Jarkko; Reyhani, Nima; Vigário, Ricardo**

*New Online-EM algorithms for general Hidden Markov models. Application to the SLAM problem*

**Le Corff, Sylvain; Fort, Gersende; Moulines, Eric**

*The role of whitening for separation of synchronous sources*

**Almeida, Miguel; Bioucas Dias, José; Vigário, Ricardo**

*To infinity and beyond: On ICA over Hilbert spaces*

**Gutch, Harold; Theis, Fabian**

**PS2d**

**Joint Diagonalization and Block-Diagonalization**

*On Computation of Approximate Joint Block-Diagonalization using Ordinary AJD*

**Tichavsky, Petr; Koldovsky, Zbynek; Yeredor, Arie**

*Joint Block Diagonalization Algorithms for Optimal Separation of Multidimensional Components*

**Lahat, Dana; Cardoso, Jean-François; Messer, Hagit**

*Joint diagonalization of several scatter matrices for ICA*

**Nordhausen, Klaus; Gutch, Harold; Oja, Hannu; Theis, Fabian**

17:00-23:00

**A trip to Jerusalem + Banquet Dinner**

## Thursday, March 15<sup>th</sup>

## "Audio Day" (at Bar-Ilan University)

09:00-09:30

**Buses to Bar-Ilan University (leaving the Sheraton hotel at 09:00)**

09:30-10:00

**Welcome and Lab Overview**  
**Sharon Gannot**, Bar-Ilan University

10:00-11:00 **Keynote Talk IV**

**From Bases to Exemplars, from Separation to Understanding**

Session Chair: **Mark Plumbley**

**Paris Smaragdis**, University of Illinois at Urbana-Champaign (USA)

11:00-11:15 **Coffee Break**

11:15-12:30 **Oral Session (OS5)**

**Special Sessions on Speech and Audio Processing I**

Session Chairs: **Emmanuel Vincent** and **Pierre Leveau**

11:15-11:35

*An on-line NMF model for temporal pattern learning Theory with Application to Automatic Speech Recognition*

**Van hamme, Hugo**

11:35-11:55

*Low-latency Instrument Separation in Polyphonic Audio Using Timbre Models*

**Marxer, Ricardo; Bonada, Jordi; Janer, Jordi**

11:55-12:15

*Real-time Speech Separation by Semi-Supervised Nonnegative Matrix Factorization*

**Joder, Cyril; Schuller, Björn; Virette, David; Eyben, Florian; Weninger, Felix**

12:15-12:30

### **Spotlight Presentations:**

*An Audio-Video Based IVA Algorithm for Source Separation and Evaluation on the AV16.3 Corpus*

**Liang, Yanfeng; Chambers, Jonathon**

*Non-negative Matrix Factorization Based Noise Reduction for Noise Robust Automatic Speech Recognition*

**Kim, Hong Kook; Lee, Yun Keun; Lee, Sung Joo Lee; Park, Ji Hun; Kim, Seon Man**

*Audio Imputation using the Non-negative Hidden Markov Model*

**Han, Jinyu; Mysore, Gautham J.; Pardo, Bryan**

*A Non-negative Approach to Language Informed Speech Separation*

**Mysore, Gautham J.; Smaragdis, Paris**

*Sound Source Separation for the Entertainment Industry*

**Leveau, Pierre; Jaureguiberry, Xabier; Maller, Simon; Burred, Juan Jose**

12:30-13:30 **Lunch Break**

(lunch served on site)

13:30-14:30 **Poster Sessions (PS3 – part 1) PS3a**

In parallel to visits to the Speech and Audio Lab (two groups)

**Special Sessions on Speech and Audio Processing II**

*An Audio-Video Based IVA Algorithm for Source Separation and Evaluation on the AV16.3 Corpus*

**Liang, Yanfeng; Chambers, Jonathon**

*Non-negative Matrix Factorization Based Noise Reduction for Noise Robust Automatic Speech Recognition*

**Kim, Hong Kook; Lee, Yun Keun; Lee, Sung Joo Lee;  
Park, Ji Hun; Kim, Seon Man**

*Audio Imputation using the Non-negative Hidden Markov Model*

**Han, Jinyu; Mysore, Gautham J.; Pardo, Bryan**

*A Non-negative Approach to Language Informed Speech Separation*

**Mysore, Gautham J.; Smaragdis, Paris**

*Sound Source Separation for the Entertainment Industry*

**Leveau, Pierre; Jaureguiberry, Xabier; Maller, Simon;  
Burred, Juan Jose**

*Efficient implementation of a system for solo and accompaniment separation in polyphonic music*

**Cano, Estefanía; Schuller, Gerald; Dittmar, Christian**

*Real-time Speech Separation by Semi-Supervised Nonnegative Matrix Factorization*

**Joder, Cyril; Weninger, Felix; Eyben, Florian; Virette, David;  
Schuller, Björn**

*Binaural Speech Separation in Reverberant Multi-source Environments*

**Kim, Hong Kook; Park, Ji Hun; Kim, Seon Man**

*Extracting a source with closest distance to microphones from convolutive mixtures*

**Lee, Soo-Young; Choi, Choong-Hwan**

## **PS3b**

### **Audio Separation and Analysis**

*Temporally-constrained Convolutional Probabilistic Latent Component Analysis for Multi-pitch Detection*

**Benetos, Emmanouil; Dixon, Simon**

*A Latently Constrained Mixture Model for Audio Source Separation and Localization*

**Deleforge, Antoine; Horaud, Radu**

*Multiple Instrument Mixtures Source Separation Evaluation Using Instrument-Dependent NMF Models*

**Vera-Candeas, Pedro; Virtanen, Tuomas; Carabias-Orti, Julio J.;  
Ruiz-Reyes, Nicolas; Rodriguez Serrano, Francisco Jose**

*Complex Extension of Infinite Sparse Factor Analysis for Blind Speech Separation*

**Nagira, Kohei; Takahashi, Toru; Ogata, Tetsuya;  
Okuno, Hiroshi G.**

*A General Framework for Online Audio Source Separation*

**Simon, Laurent S. R.; Vincent, Emmanuel**

*Sound Recognition in Mixtures*

**Nam, Juhan; Mysore, Gautham J.; Smaragdis, Paris**

14:30-14:45 **Coffee Break**

14:45-15:45 **Poster Sessions  
(PS3 – part 2)**

Continuing the poster sessions PS3a and PS3b in parallel to lab visits (two additional groups)

15:45-16:00 **Closing Remarks**

16:00-16:30

**Buses back to the Sheraton Hotel**