

## Workshop III: Mathematical Foundations and Algorithms for Tensor Computations

### Monday May 3, 2021

- 7:55      *Session Chairs: Anna Seigal (Oxford) and André Uschmajew (Max Planck Institute)*
- 7:55–8:00      *Welcome & Opening Remarks: Dean Miguel García-Garibay (Dean of Physical Sciences, UCLA) and Dima Shlyakhtenko (Director, IPAM)*
- 8:00–8:30      **Alex Wein** (New York University)  
*The Kikuchi Hierarchy and Tensor PCA*
- 8:40–8:55      *Break*
- 8:55–9:25      **Rong Ge** (Duke University)  
*Beyond Lazy Training for Over-parameterized Tensor Decomposition*
- 9:35–9:50      *Break*
- 9:50–10:20      **Kaie Kubias** (Aalto University)  
*Rank-one tensor completion*
- 10:30–10:45      *Break*
- 10:45–11:15      **Mateusz Michalek** (Universität Konstanz)  
*Algebraic methods to construct tensors*
- 11:30–11:55      *Lightning Poster Presentations - Presenters: Nick Dewaele (KU Leuven); Yuetian Luo (Univ. Wisconsin); Kevin Slagle (Caltech); Deqing Wang (Dalian University of Technology); and Zi Yang (UC San Diego)*
- 11:55–12:25      *Poster Session (please go to the "Poster Session" tab to view posters)*

### Tuesday May 4, 2021

- 8:00      *Session Chair: Aravindan Vijayaraghavan (Northwestern)*
- 8:00–8:30      **Nick Vannieuwenhoven** (KU Leuven )  
*Sensitivity of tensor decompositions*
- 8:40–8:55      *Break*
- 8:55–9:25      **Paul Breiding** (Technische Universität Berlin)  
*Pencil-based algorithms for tensor rank decomposition are not stable*
- 9:35–9:50      *Break*
- 9:50–10:20      **Anh-Huy Phan** (Skolkovo Institute of Science and Technology)  
*Chain Tensor Network: Instability and how to deal with it*
- 10:30–10:45      *Break*

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10:45–11:15 **Venera Khoromskaia** (Max-Planck-Institut für Mathematik in den Naturwissenschaften)  
*Tensor numerical modeling of the collective electrostatic potentials in many-particle systems*

11:25–11:40 *Break*

11:40–12:10 **Bart Vandereycken** (Université de Genève)  
*Algorithms for dynamical low-rank approximation*

### Wednesday May 5, 2021

8:00 *Session Chair: Jiawang Nie (UC San Diego)*

8:00–8:30 **Nikos Sidiropoulos** (University of Virginia)  
*Supervised Learning and Canonical Decomposition of Multivariate Functions (Joint work with Nikos Kargas)*

8:40–8:55 *Break*

8:55–9:25 **David Perez-Garcia** (Universidad Complutense de Madrid)  
*Spectral gap in PEPS*

9:35–9:50 *Break*

9:50–10:20 **Yang Qi** (Institut National de Recherche en Informatique et Automatique (INRIA))  
*Inner and outer approximations of tropical polytopes and their applications in tropical tensors*

10:30–10:45 *Break*

10:45–11:15 **Maksim Rakhuba** (Higher School of Economics)  
*Quantized tensor decompositions: challenges and applications*

11:25–11:40 *Break*

11:40–12:10 **Elina Robeva** (University of British Columbia)  
*Hidden Variables in Linear Non-Gaussian Causal Models*

### Thursday May 6, 2021

8:00 *Session Chair: Norbert Schuch (Univ. Vienna)*

8:00–8:30 **Tselil Schramm** (Stanford University)  
*Fast Spectral Algorithms for Tensor Decomposition from Sum-of-Squares Analyses*

8:40–8:55 *Break*

8:55–9:25 **Madeleine Udell** (Cornell University)  
*Low Rank Tucker Approximation of a Tensor from Streaming Data*

9:35–9:50 *Break*

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- 9:50–10:20 **Jiawang Nie** (University of California, San Diego (UCSD))  
*Learning Diagonal Gaussian Mixture Models and Incomplete Tensor Decompositions*
- 10:30–10:45 *Break*
- 10:45–11:15 **Aravindan Vijayaraghavan** (Northwestern University)  
*Smoothed Analysis for Tensor Decompositions and Unsupervised Learning*
- 11:30 *Conclusion*

