Dagstuhl Perspectives Workshop | 10-13 April 2016

Tensor Computing for the Internet of Things

Workshop on State of the Art and Future Directions

Agenda (as of 2016-04-011)

April 10 – Day 1:	Common Ground
17:00 – 18:00	Informal Gathering
18:00 – 19:00	Dinner
20:30 – 22:00	Fireside Chat: Synergies, similarities

April 11 – Day 2:	Sharing Perspectives
09:00 – 12:00	Internet of Things – Multidimensional IoT data & what information we want to extract from it for what purpose, data sources & peculiarities, IoT/CPS computing infrastructures & peculiarities

Impulse Talks: IoT Applications and Computing Infrastructures

Christine Preisach: IoT & applications such as predictive maintenance

Gerwald Lichtenberg: Multilinear systems, fault diagnosis and supervisory control

Sebnem Rusitschka: Heterogeneous computing infrastructures available in (future) energy and transportation networks

Panel Discussion: Challenges of Tensor Representations for IoT data

Kareem Aggour: Equipment sensors over time - large, dense, and skewed 3-way datasets

Souleiman Hasan: IoT sensors in water management, energy management, smart cities – tensor-based semantic representation in event data vectors

Denis Krompaß: Sensors in power networks - representing network dynamics over space and time

12:15 – 13:00	Lunch

13:00 – 15:30	Machine Learning I – Tensor-based information extraction methods from multidimensional (sensor) data
	Impulse Talks I: Tensor Decompositions
	Rasmus Bro: Tensor factorization models & applications
	Morten Mørup: Tensor applications in neuroscience
	Evrim Acar: Data fusion based on coupled tensor factorizations
	Volker Tresp: Tensors for representational learning
15:30 – 15:45	Coffee Break
15:45 – 18:00	Tensor Computing I – Computational foundations, tools, libraries
	Impulse Talks: Overview of Needs, Capabilities, Potentials
	Ivan Oseledets: Tensor networks, tensor trains
	Lieven De Lathauwer: Advances in the numerical computation of tensor and coupled decompositions
	Lenore Mullin: Optimizing core tensor computations
18:00 – 19:00	Dinner

09:00 – 10:30   Machine Learning II – Tensor-based information extraction methods from multidimensional (sensor) data

Impulse Talks II: Tensors beyond

Ivan Oseledets: Tensor networks, tensor trains

Anima Anandkumar: Tensors & neural networks

Renato Pajarola: Tensor techniques for the visualization of multidimensional data

10:30 – 10:45   Coffee Break

10:45 – 11:30   Tensor Computing II

Panel Discussion: Challenges of Tensor Computing for IoT

Benoit Meister: Real-time analysis & power efficient algorithms

Vagelis Paplexakis: Big signal processing for multi-aspect data mining

Bülent Yener: Modeling of complex, man-made systems

11:30 – 12:00   Wrap-up I: Forming multidisciplinary synergy clusters

12:00 – 13:00   Lunch

13:00 – 14:30   Break-out sessions (multidisciplinary/disciplinary roadmaps)

14:30 – 15:00   Coffee Break

15:00 – 17:00   Presentations

18:00 – 19:00   Dinner

20:30 – 22:00   Fireside chat: Building bridges, across gaps and towards new shores

April 13 – Day 4:   Manifesto

09:00 – 12:00   Value proposition of our multidisciplinary research

12:15 – 13:00   Lunch

13:00 – 14:30   Call to Action

14:30 – 15:00   Wrap up II