

Mathematics of Knowledge and Search Engines: Tutorials

Tuesday September 11, 2007

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–12:00 *Welcome and Opening Remarks*
- 9:00–10:00 **Kendall Giles** (Johns Hopkins University)
Basics of PageRank algorithm
- 10:00–10:30 *Break*
- 10:30–11:30 **Kendall Giles** (Johns Hopkins University)
Basics of knowledge discovery engines
- 11:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Petros Drineas** (Rensselaer Polytechnic Institute)
Information retrieval and data mining: A linear algebraic perspective
- 3:00–3:30 *Break*
- 3:30–4:30 **Petros Drineas** (Rensselaer Polytechnic Institute)
Information retrieval and data mining: A linear algebraic perspective

Wednesday September 12, 2007

- 8:00–9:00 *Continental Breakfast*
- 9:00–10:00 **Yuval Rabani** (Technion - Israel Institute of Technology)
Metric Geometry and Combinatorial Data Analysis
- 10:00–10:30 *Break*
- 10:30–11:30 **Yuval Rabani** (Technion - Israel Institute of Technology)
Metric Geometry and Combinatorial Data Analysis
- 11:30–1:00 *Lunch (on your own)*
- 1:00–2:30 **Rafail Ostrovsky** (University of California, Los Angeles (UCLA))
Nearest neighbor search and clustering methods
- 2:30–3:00 *Break*
- 3:00–4:00 **Peter Jones** (Yale University)
Hierarchical structures in data sets, local coordinate systems and eigenfunctions of Laplace-type operators
- 4:00–4:30 *Break*

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4:30–5:30 **Peter Jones** (Yale University)
Hierarchical structures in data sets, local coordinate systems and eigenfunctions of Laplace-type operators

Thursday September 13, 2007

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Yannet Interian** (University of California, Berkeley (UC Berkeley))
Introduction to structure of information networks

10:00–10:30 *Break*

10:30–11:30 **Yannet Interian** (University of California, Berkeley (UC Berkeley))
Introduction to structure of information networks

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **Shivkumar Chandrasekaran** (University of California, Santa Barbara (UC Santa Barbara))
Fast algorithms for inverting the FMM

3:00–3:30 *Break*

3:30–4:30 **Zhenyu (Victor) Liu** (Google)
Metasearch

Friday September 14, 2007

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Uri Schonfeld** (Shuri)
Web crawling

10:00–10:30 *Break*

10:30–11:30 **Yann LeCun** (New York University)
Similarity measures, Knowledge building

11:30–1:00 *Lunch (on your own)*

1:00–2:00 **Yann LeCun** (New York University)
Similarity measures, Knowledge building

2:00–2:30 *Break*

2:30–3:30 **Mark Tygert** (Yale University)
Randomized algorithms in numerical linear algebra 1

3:30–4:00 *Break*

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4:00–5:00 **Mark Tygert** (Yale University)
Randomized algorithms in numerical linear algebra 2

Monday September 17, 2007

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Edo Liberty** (Yale University)
Fast dimension reduction

10:00–10:30 *Break*

10:30–11:30 **Per-Gunnar Martinsson** (Yale University)
Randomized methods to construct low-rank approximations to matrices

11:30–2:00 *Lunch (on your own)*

2:00–3:00 **James Bremer** (Yale University)
Reordering of matrices, Group classification by answers to questionnaires

3:00–3:30 *Break*

3:30–4:30 **James Bremer** (Yale University)
Reordering of matrices, Group classification by answers to questionnaires

Tuesday September 18, 2007

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Inderjit Dhillon** (University of Texas at Austin)
Cluster analysis/clustering

10:00–10:30 *Break*

10:30–11:30 **Inderjit Dhillon** (University of Texas at Austin)
Cluster analysis/clustering

11:30–1:00 *Lunch (on your own)*

1:00–2:30 **Yair Bartal** (Hebrew University)
Search trees and metric embeddings, Fast access to data/storage, to be confirmed

2:30–3:00 *Break*

3:00–4:00 **Yosi Keller** (Bar-Ilan University)
Pattern recognition of high-dimensional data in diffusion spaces, Graph similarity as a tool for object recognition and high-dimensional pattern recognition

4:00–4:30 *Break*

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- 4:30–5:30 **Yosi Keller** (Bar-Ilan University)
Pattern recognition of high-dimensional data in diffusion spaces, Graph similarity as a tool for object recognition and high-dimensional pattern recognition
- 5:30–7:00 Reception (Location: IPAM Lobby)

Wednesday September 19, 2007

- 8:00–9:00 *Continental Breakfast*
- 9:00–10:00 **Yoel Shkolnisky** (Yale University)
Geometric inversion problems with case studies in structural biology and sensor networks
- 10:00–10:30 *Break*
- 10:30–11:30 **Yoel Shkolnisky** (Yale University)
Geometric inversion problems with case studies in structural biology and sensor networks
- 11:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Arthur Szlam** (University of California, Los Angeles (UCLA))
Geometric harmonics and image analysis
- 3:00–3:30 *Break*
- 3:30–4:30 **Raanan Schul** (University of California, Los Angeles (UCLA))
Curvature and spanning trees in metric spaces

Thursday September 20, 2007

- 8:00–9:00 *Continental Breakfast*
- 9:00–10:00 **Ran El-Yaniv** (Technion - Israel Institute of Technology)
Text categorization
- 10:00–10:30 *Break*
- 10:30–11:30 **Ran El-Yaniv** (Technion - Israel Institute of Technology)
Text categorization
- 11:30–1:00 *Lunch (on your own)*
- 1:00–2:00 **Johan Walden** (University of California, Berkeley (UC Berkeley))
Questions and issues in economics and finance related to search engines

