Low-rank approximation techniques

Cursus

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<thead>
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<th>Sem.</th>
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<tr>
<td>Computational science and Engineering</td>
<td>MA1, MA3</td>
<td>Opt.</td>
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<td>Ing.-math</td>
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<td>Statistics</td>
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Remark
pas donné en 2023-24

Summary


Content

- Theoretical background of low-rank matrix approximation
- Classical algorithms for low-rank approximation
- Randomized low-rank approximation
- Low-rank approximation by deterministic column/row selection
- Low-rank approximation by randomized sampling
- Basic introduction to tensors
- Tensor rank, CP, Tucker, and TT decompositions of tensors
- Alternating least-squares algorithms
- Optional: Riemannian optimization on low-rank matrix and tensor manifolds
- Optional: Dynamical low-rank approximation
- Applications of low-rank approximation in data analysis, model and dimensionality reduction

Resources

Moodle Link
- https://go.epfl.ch/MATH-403