



Graphs in Machine Learning

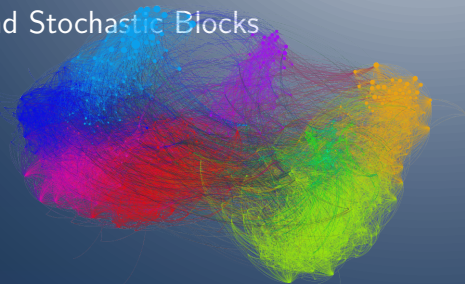
Random Graph Models

Erdős–Rényi, Barabási–Albert, and Stochastic Blocks

Michal Valko

Inria & ENS Paris-Saclay, MVA

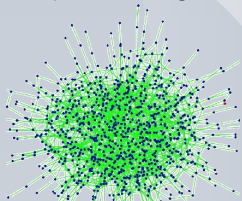
Partially based on material by: Andreas Krause,
Branislav Kveton, Michael Kearns



The in-between option: random graph models

Erdős-Rényi

independent edges



The in-between option: random graph models

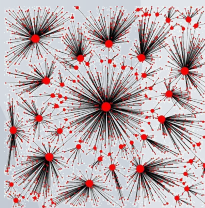
Erdős-Rényi

independent edges



Barabási-Albert

preferential attachment



The in-between option: random graph models

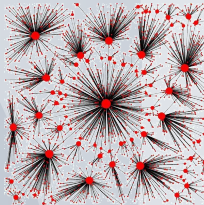
Erdős-Rényi

independent edges



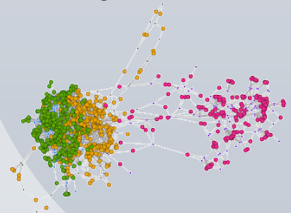
Barabási-Albert

preferential attachment



Stochastic Blocks

modeling communities



The in-between option: random graph models

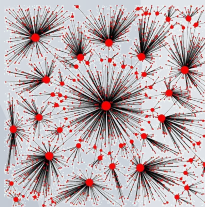
Erdős-Rényi

independent edges



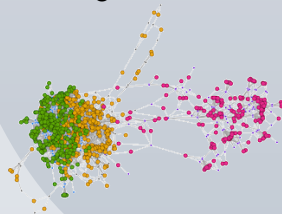
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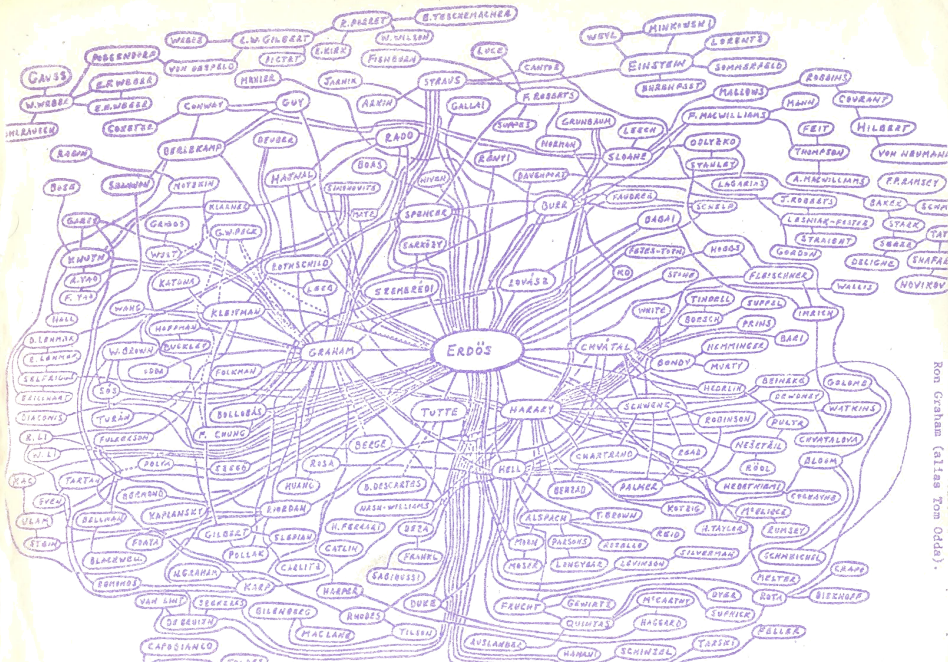


Stochastic Blocks

modeling communities



Watts-Strogatz, Chung-Lu, Fiedler,



Ron Graham (alias Tom Odde).

Erdős number project

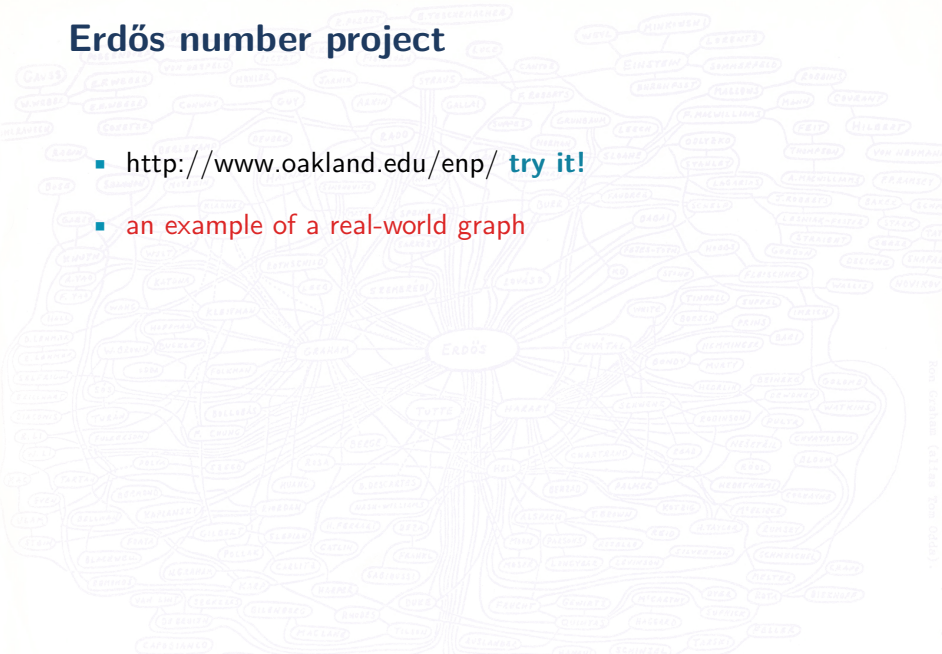
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Erdős number project

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- an example of a real-world graph



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Erdős number project

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- average distance for the largest component: 7.64
- 6 degrees of separation [Travers & Milgram, 1967]
- **heavy tail**

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`https://misovalko.github.io/mva-ml-graphs.html`

