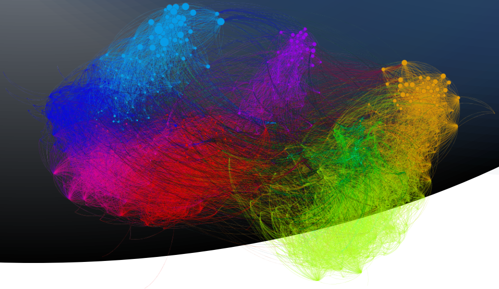
Graphs in Machine Learning

Google PageRank: Introduction

Random Surfer Model

Michal Valko

Inria & ENS Paris-Saclay, MVA



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

Success story #2 Google `PageRank`

Objective: **Rank** all web pages (nodes on the graph) by how **many** other pages link to them and how **important** they are.

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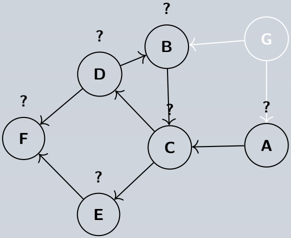

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Random Surfer Process

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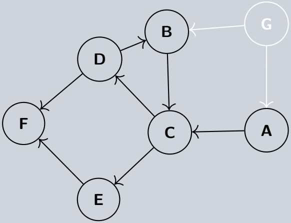

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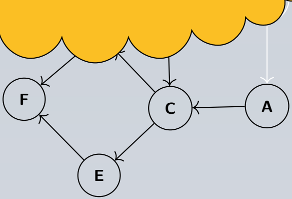

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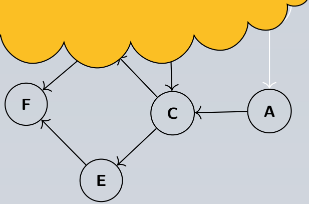

dangling pages act like sinks

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http://infolab.stanford.edu/~backrub/google.html:

PageRank can be thought of as a model of user behavior. We assume there is a "random surfer" who is given a web page at random and keeps clicking on links, never hitting "back" but eventually gets bored and starts on another random page.

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- importance of a page is distributed **evenly**
- probability of being bored is 15%

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