

Introduction to Social Network Analysis with Pajek

Jožef Stefan International Postgraduate school

Vid Podpečan, Jure Ferlež
{vid.podpecan, jure.ferlez} @ ijs.si

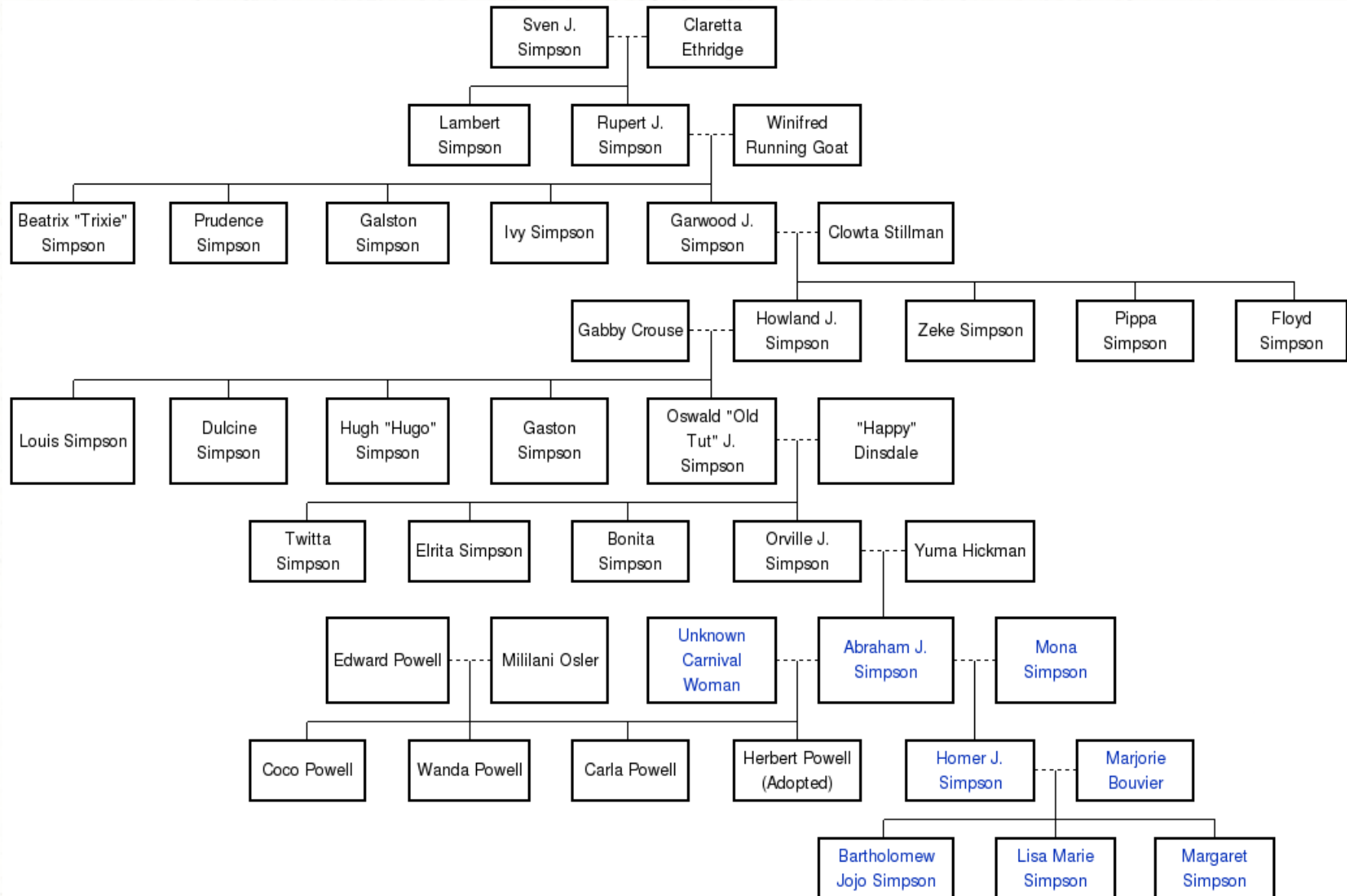
Overview

- introduction:
 - social networks
 - relation with graph theory
- basic concepts of graph theory with examples
- introduction to Pajek tool:
 - interface, input, data structures, visualization, network operations
- step-by-step analysis of networks using Pajek
- examples of real life datasets

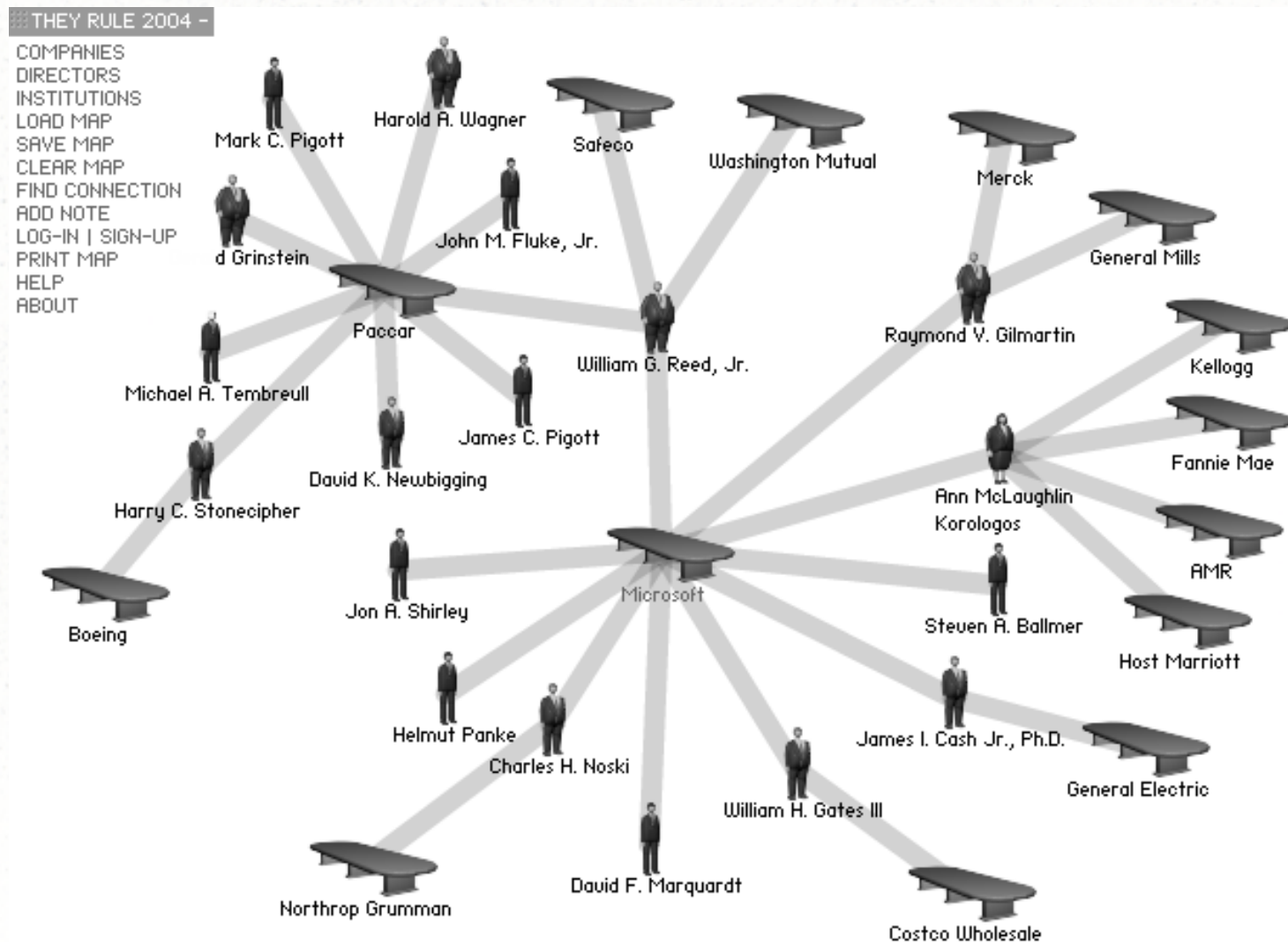
Social network

- a social structure made of:
 - **nodes** (individuals, organizations)
 - **ties:** interdependency between nodes:
 - friendship, kinship, conflict, common ideas, financial exchange, trade, ...
 - **additional data:** helps to interpret the network
- network = graph + data
- examples:
 - family tree, world trade, email contacts, classroom relations, love triangle, coauthorships, ...

Example: The Simpson family tree



Example: TheyRule 2004



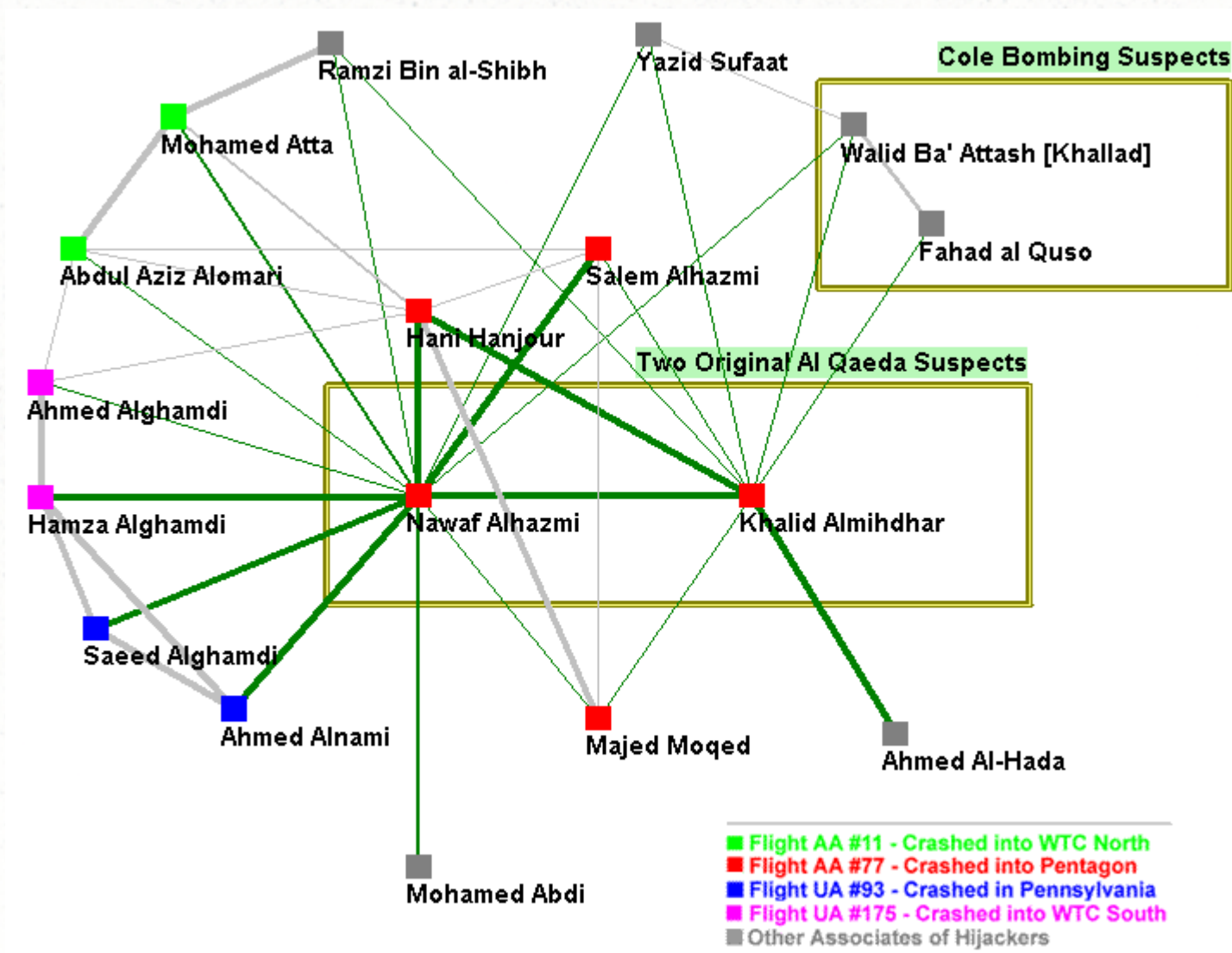
Social network analysis

- analyzing social networks using **graph algorithms**, **visualization** methods, manual inspection and **pattern discovery** algorithms
- **interpretation and explanation** of patterns:
 - from structure to relation to individual
 - how the structure of ties affects individuals and their relationships
 - attributes of individuals are now less important than their relationships and ties with other actors

Social network analysis

- **example:** mass surveillance
 - Total Information Awareness program (by DARPA)
 - key characteristics of terrorist groups
 - how to discriminate terrorist groups from other types of societal groups
- **example:** power of individual within organization:
 - actual job title OR
 - **position at the center of many relationships**
- **example:** epidemiology
 - influence of patterns of human contacts on disease spreading (e.g. HIV)

Example: The 9/11 Terrorist SN



SNA in practice

- software tools:
 - NetMiner, Visone, StOCNET, InFlow
 - UCINET, Pajek, ORA
 - SocNetV, SocioMetrica
- companies:
 - Orgnet.com, CYRAM, Visible Path
- resources:
 - <http://vlado.fmf.uni-lj.si/pub/networks/data/default.htm>
 - www.orgnet.com
 - <http://manyeyes.alphaworks.ibm.com/manyeyes/>