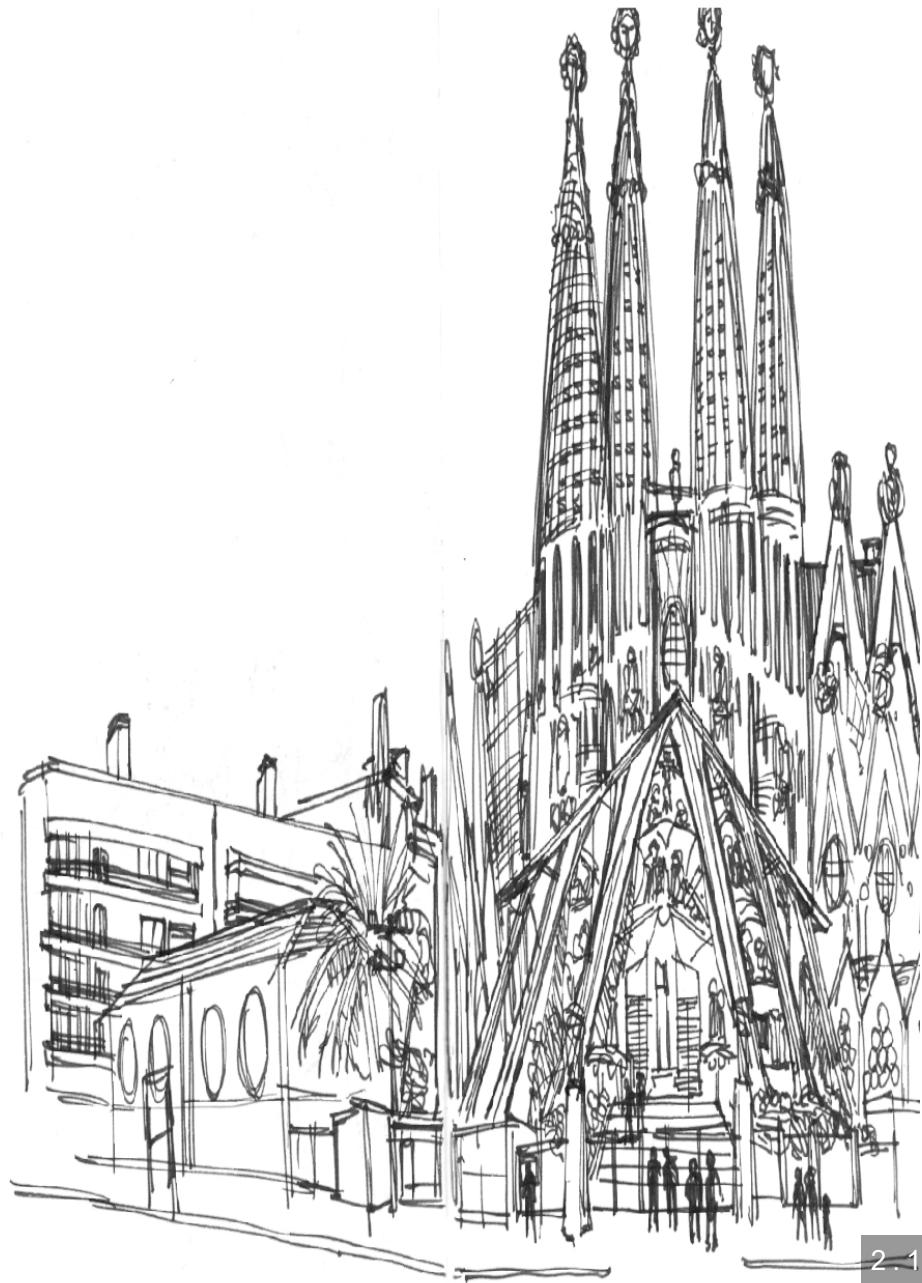


COMMUNICATION NETWORKS IN ORGANIZATIONS

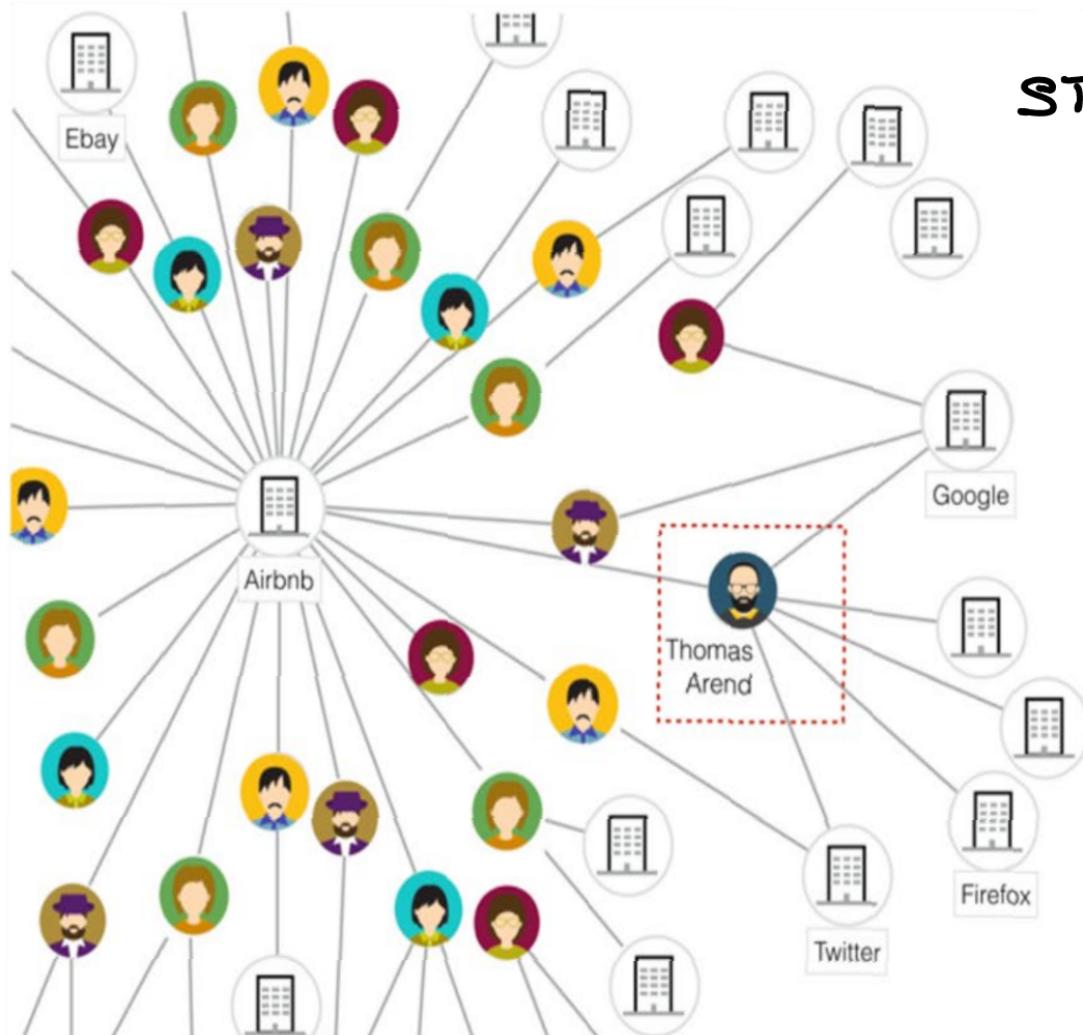
WHICH INSIGHTS WE CAN GET

Matteo Neri









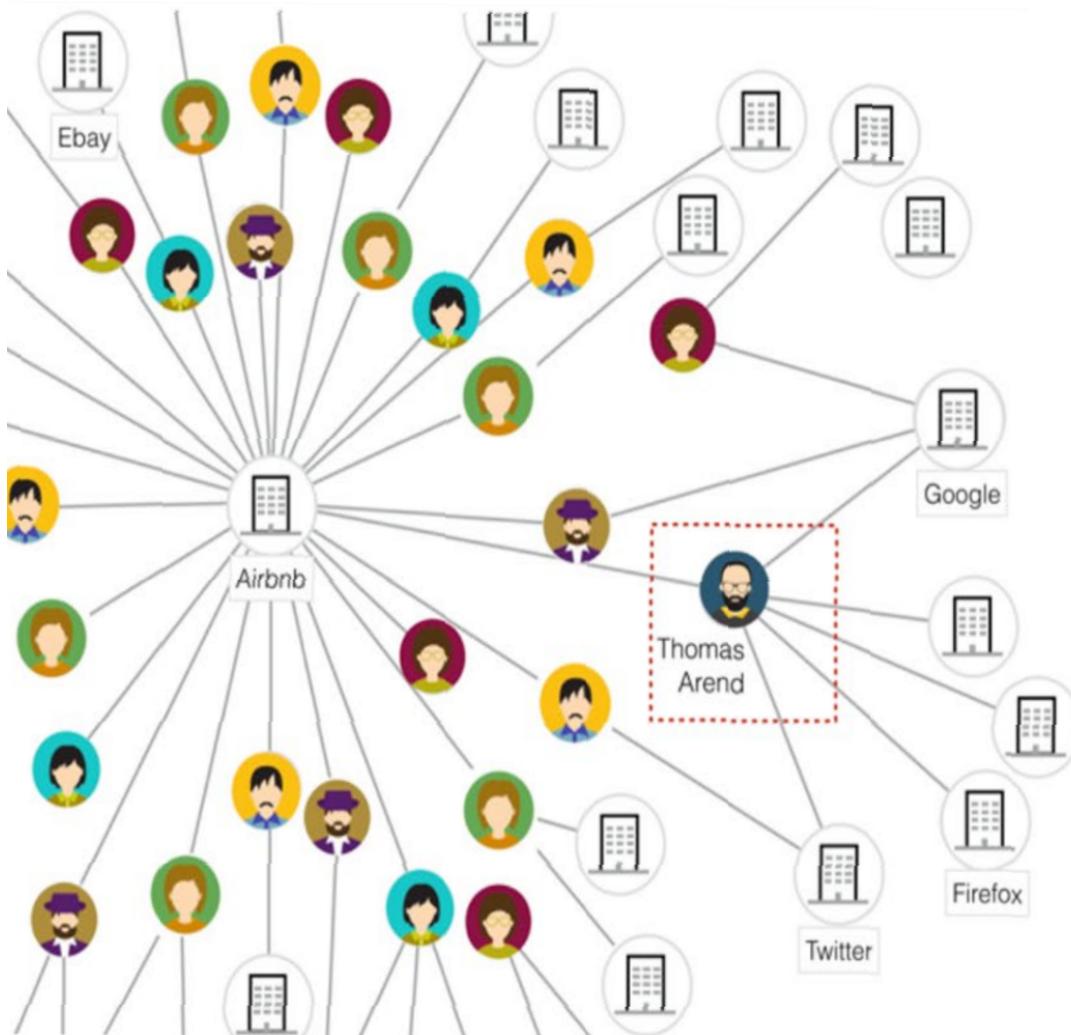
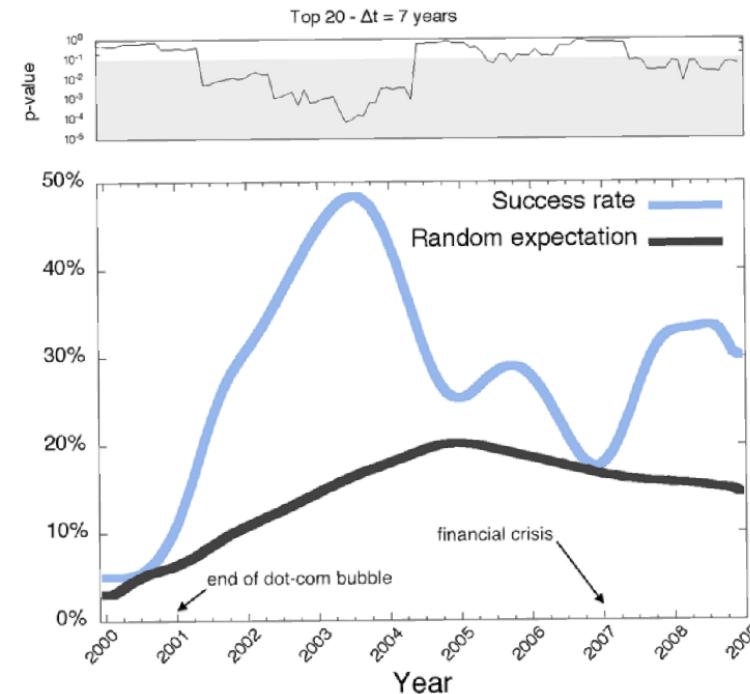
START-UP NETWORK

- TIME VARYING
- GROWING
- LINK: EXCHANGE OF KNOW-HOW

EARLY-STAGE PREDICTION

CLOSENESS BASED
RANKING OF OPEN DEALS

$$H(x) = \sum_{y \neq x} \frac{1}{d(x,y)}$$



HUMAN CAPITAL





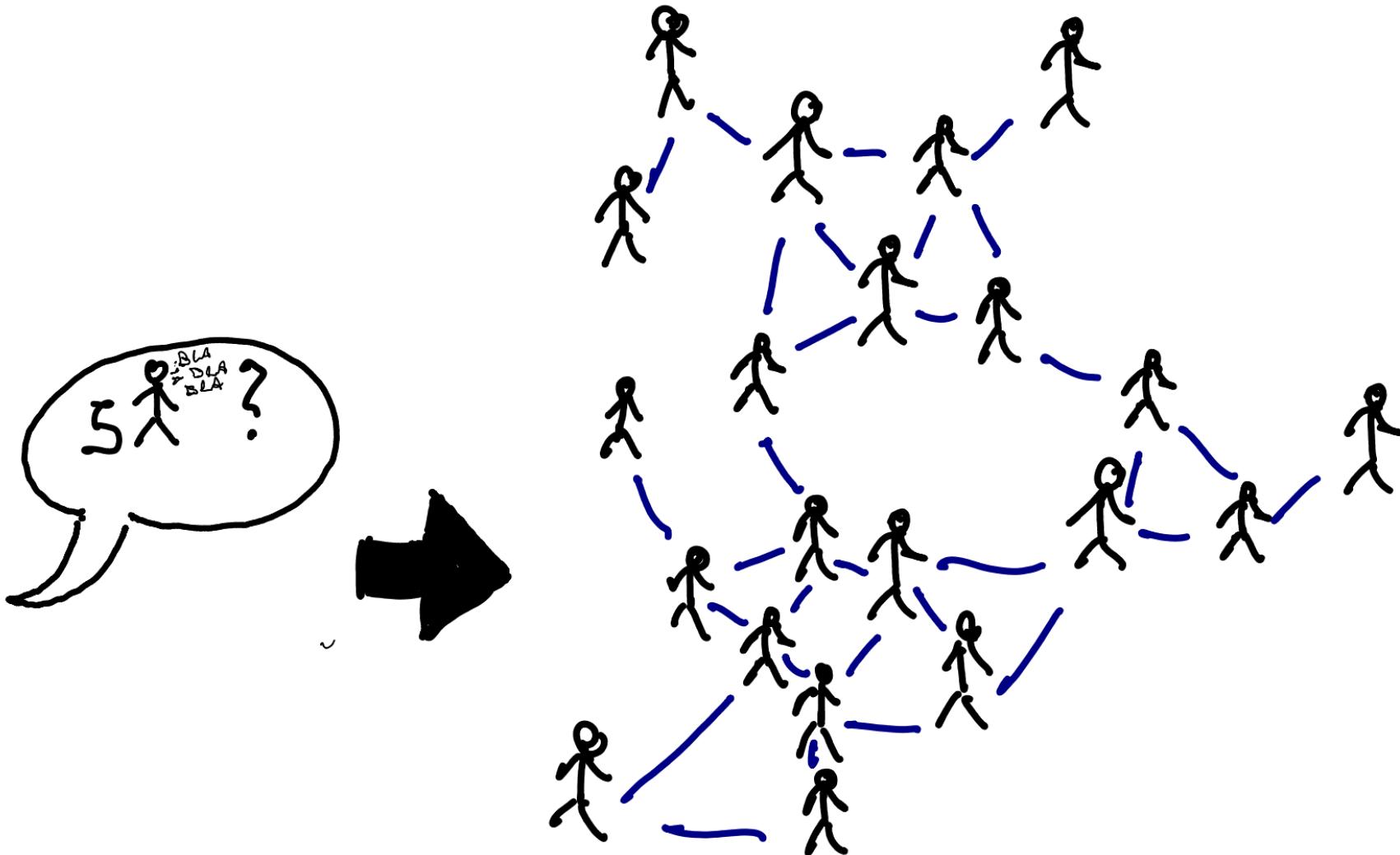
ENHANCING HUMAN CAPITAL

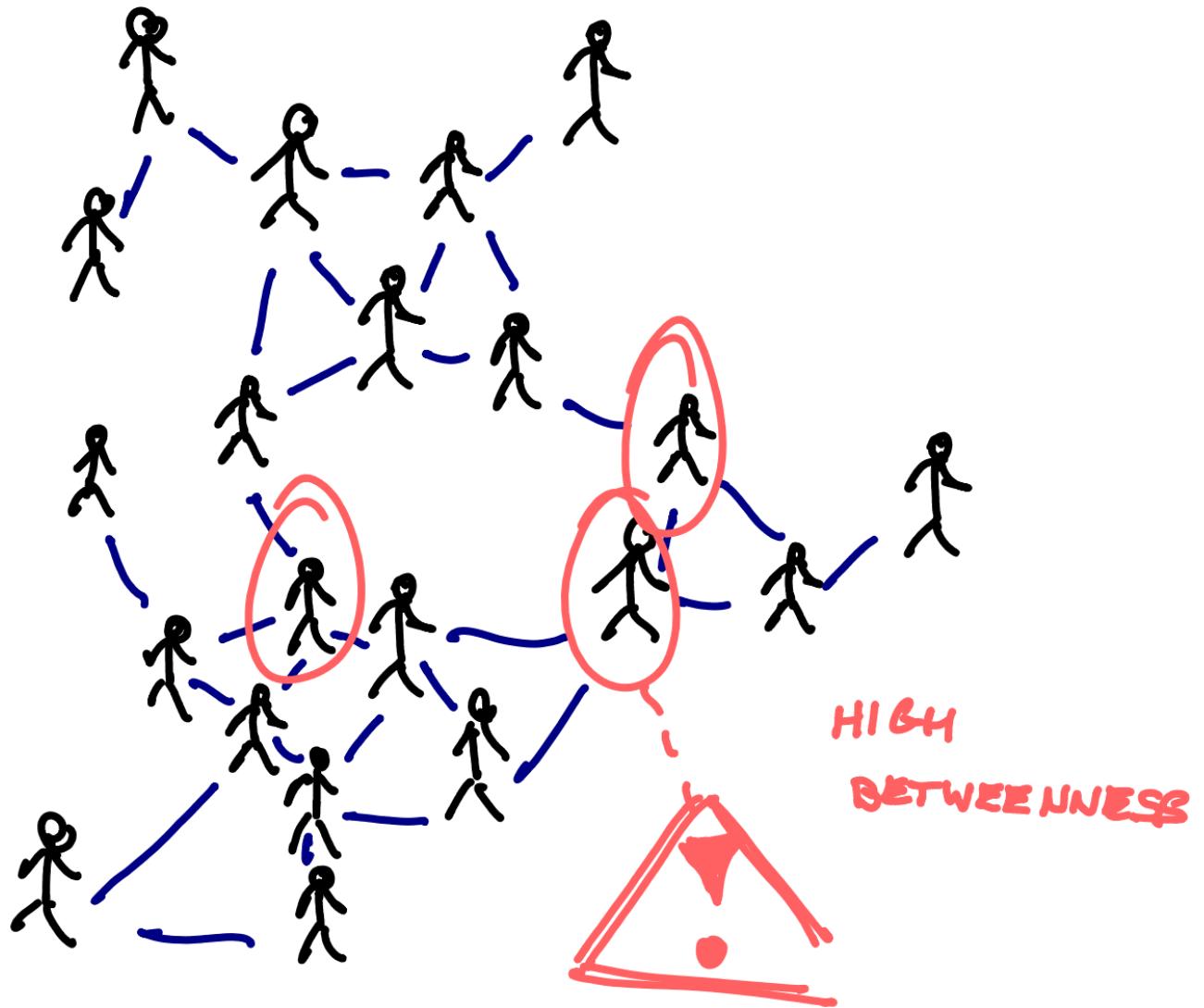
↳ INDIVIDUAL LEVEL

↳ SOCIAL LEVEL

COMMUNICATION
NETWORK

BARABASI





DATA

neo4j-users

● michael.hunger

★ STARRED

● Mark Needham

CHANNELS



general

help

help-cypher

help-import

help-modeling

neo4j-dotnet

neo4j-java

neo4j-javascript

neo4j-php

neo4j-python

neo4j-rstats

neo4j-ruby

neo4j-sdn

organize-meetups

#general

Company-wide announcements and work-based matters



Claudia Remlinger 12:02 PM

joined #general. Also, @mulkave joined.



Christophe Willemsen 12:04 PM

@albertoperdomo: stunningly funny



Abed Halawi 12:09 PM

@albertoperdomo



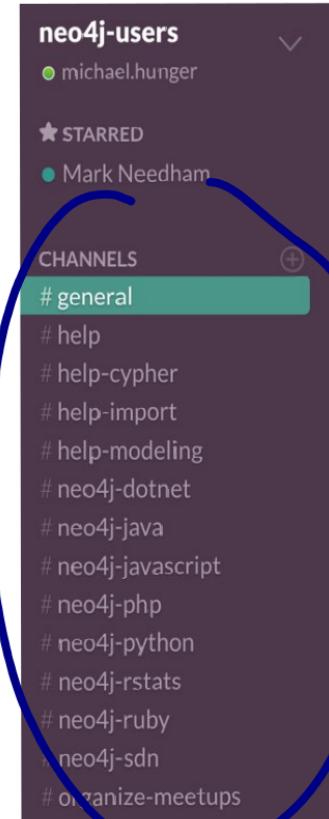
Alberto Perdomo 12:09 PM

Hello @mulkave !



Dom Davis 12:10 PM ★

CHANNELS ↵
SLACK MESSAGES
OVER A
2 YEARS PERIOD
(AND COUNTING)

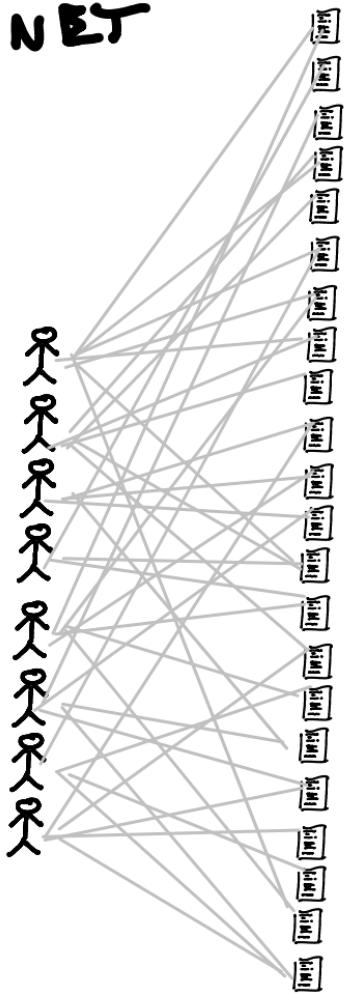


#general ▾ Company-wide announcements and work-based matters

A screenshot of the #general Slack channel. At the top right are video and share icons. Below is a message from 'Claudia Remlinger' at 12:02 PM: 'joined #general. Also, @mulkave joined.' Below that is a message from 'Christophe Willemsen' at 12:04 PM: '@albertoperdomo: stunningly funny'. Next is a message from 'Abed Halawi' at 12:09 PM: '@albertoperdomo' with a thumbs-up emoji. Then a message from 'Alberto Perdomo' at 12:09 PM: 'Hello @mulkave !'. Finally, a message from 'Dom Davis' at 12:10 PM: '★' with a star emoji. A blue arrow points from the bottom of the channel list towards the messages, with the word 'CONVERSATION' written below it.

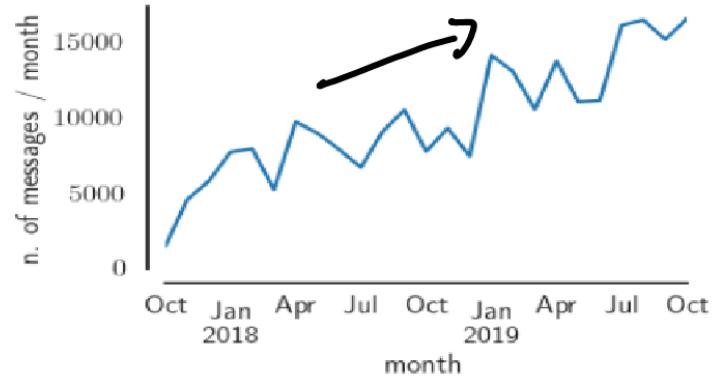
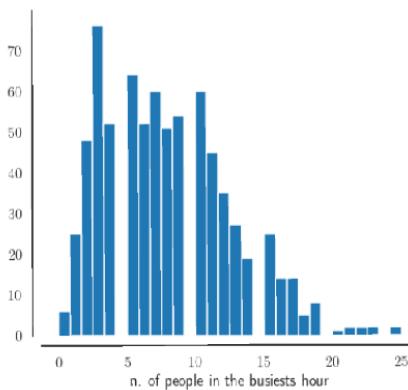
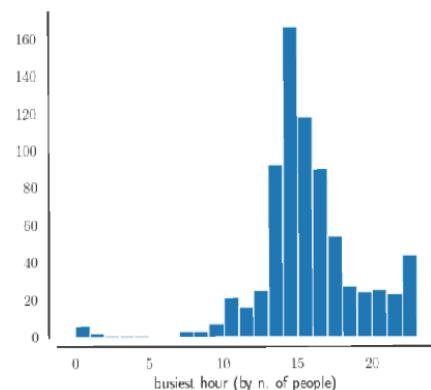
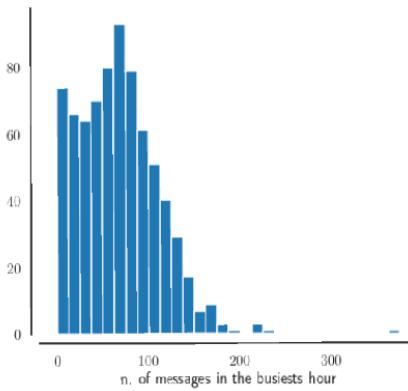
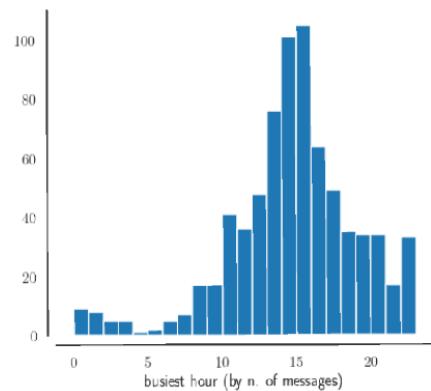
CONVERSATION ↴

BIPARTITE NET



117 USERS
1438 CHANNELS

VS WAKES UP



PARTICULARITY OF THE DATA:

(ALMOST)

- ALL THE COMMUNICATIONS HAPPEN THROUGH SLACK
- DELOCALIZED COMPANY (4+ CONTINENTS)

INSIGHTS

BURSTINESS

AN INTERMITTENT INCREASES AND DECREASES
IN THE ACTIVITY OF EVENTS

→ IN HUMAN INTERACTIONS THE
EVENT SEQUENCE HAS STRONG
TEMPORAL HETEROGENEITIES

↪ WE TYPICALLY STUDY THE
INTER-EVENT TIME: $\tau_i = t_{i+1} - t_i$

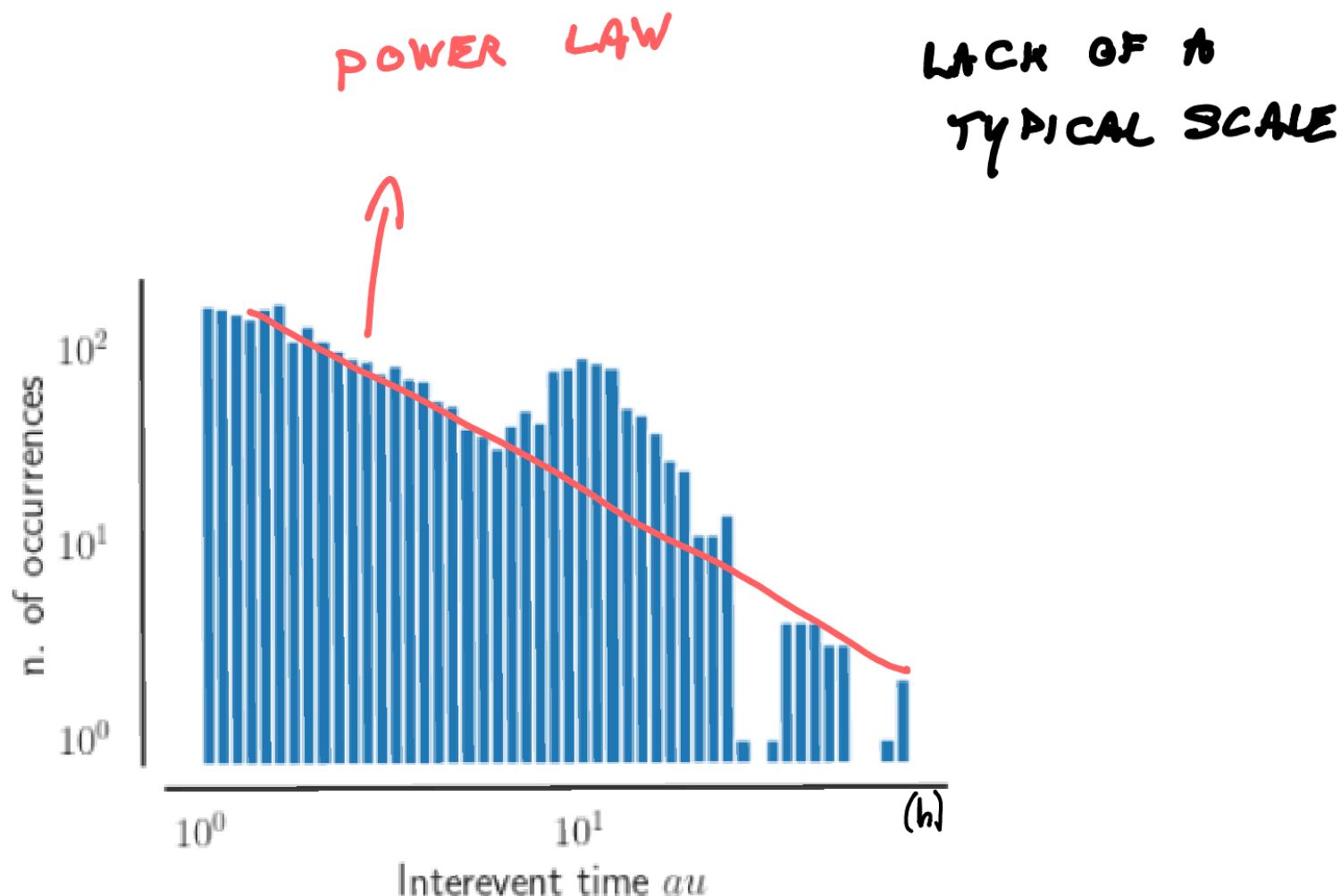
GOH, BARABASI

$$B = \frac{\sigma - \langle \tau \rangle}{\sigma + \langle \tau \rangle}$$

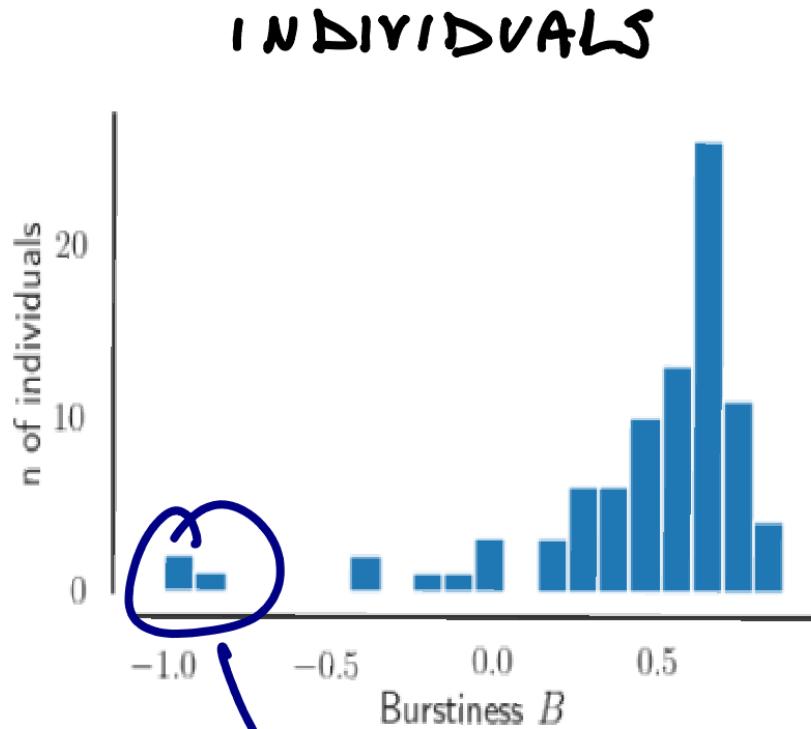
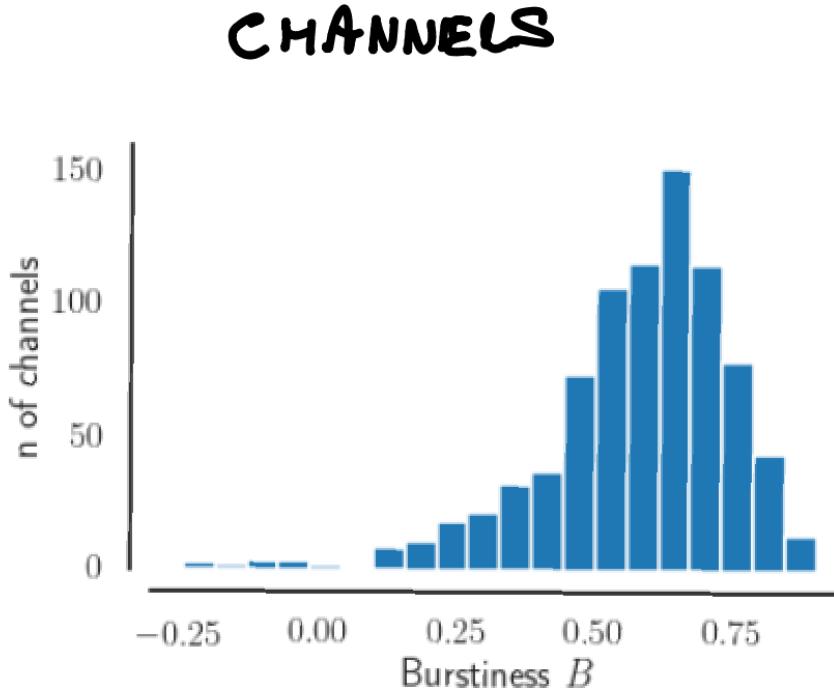
$$B \rightarrow -1 \quad \sigma = 0$$

$$B \rightarrow 0 \quad \text{POISSON} \quad \sigma = \langle \tau \rangle$$

$$B > 0 \quad \text{BURSTY PROCESS}$$

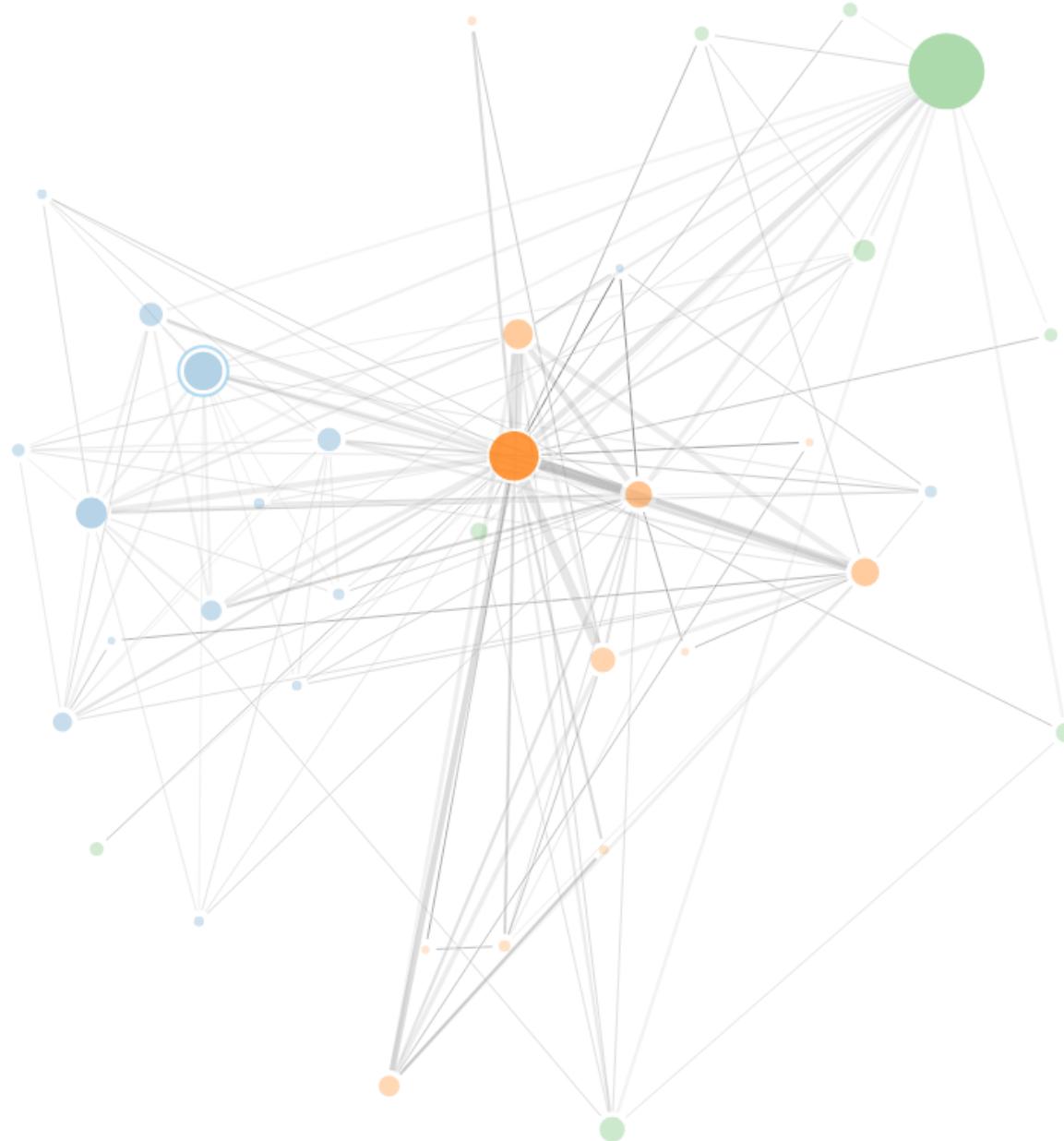


INTER EVENT TIME
DISTRIBUTION FOR A
SINGLE USER



2
BOTS

DETECTING COMMUNITIES

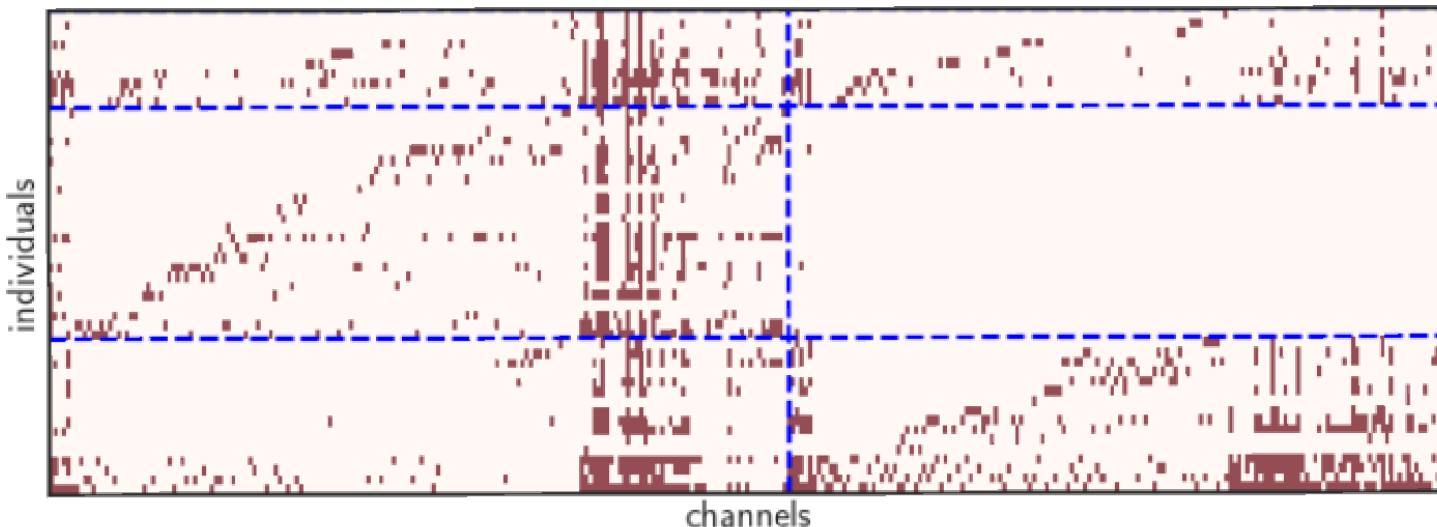


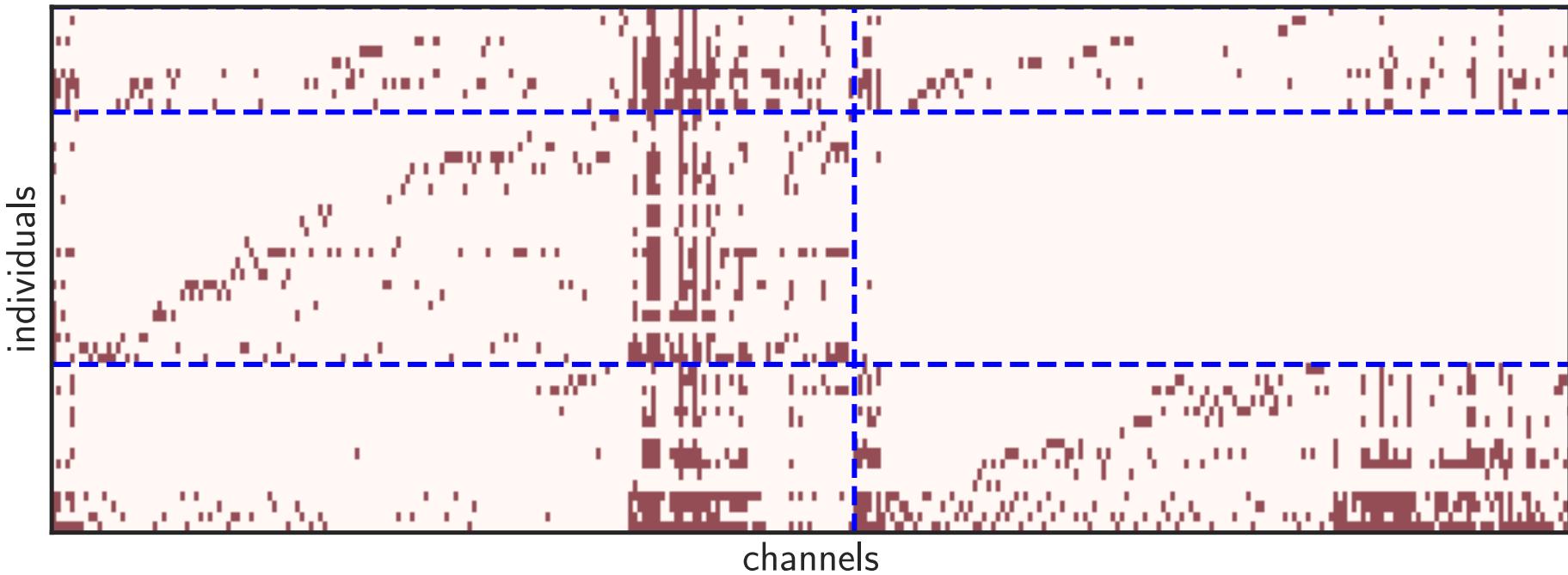
COMMUNITY STRUCTURE (SBN)

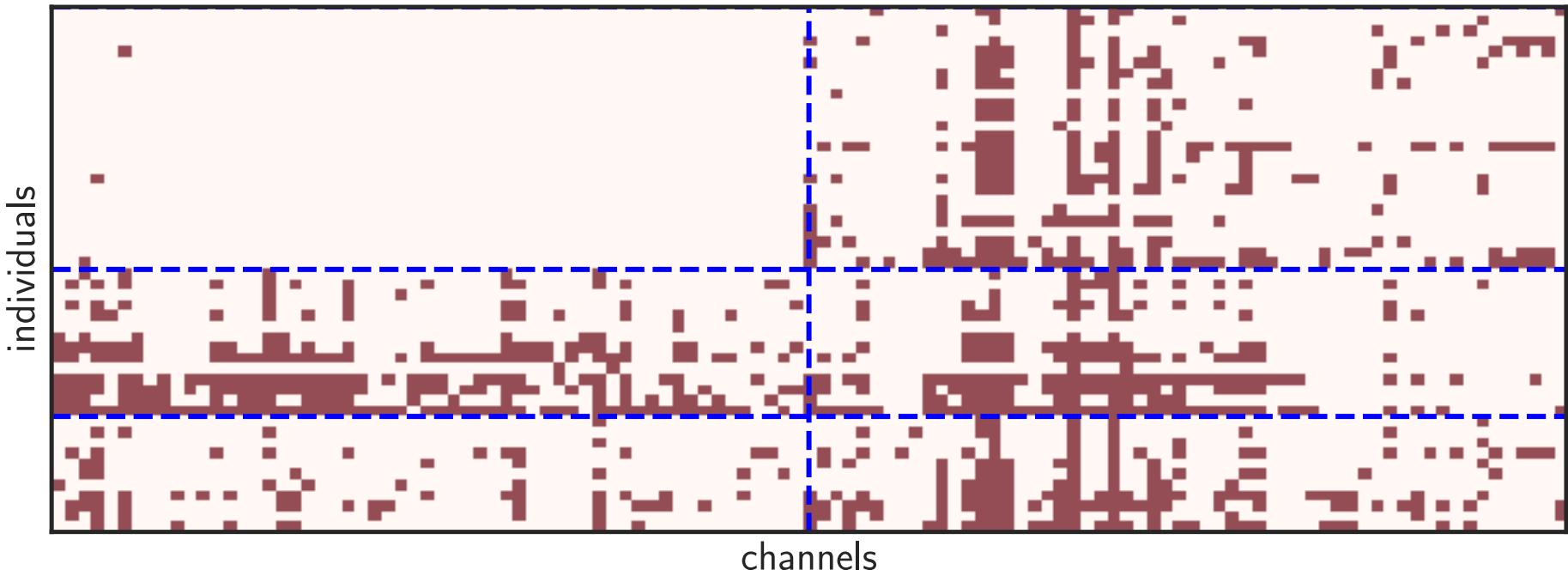
STOCHASTIC BLOCK MODELS:

- GENERATIVE PROBABILISTIC MODELS
FOR NETWORK WITH BLOCK OR COMMUNITY
STRUCTURES.

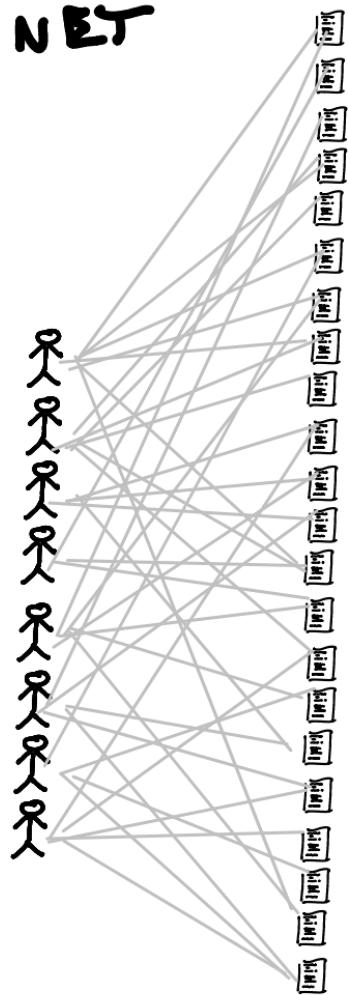
2014 LARREDORE, CLAUSET, JACOBS







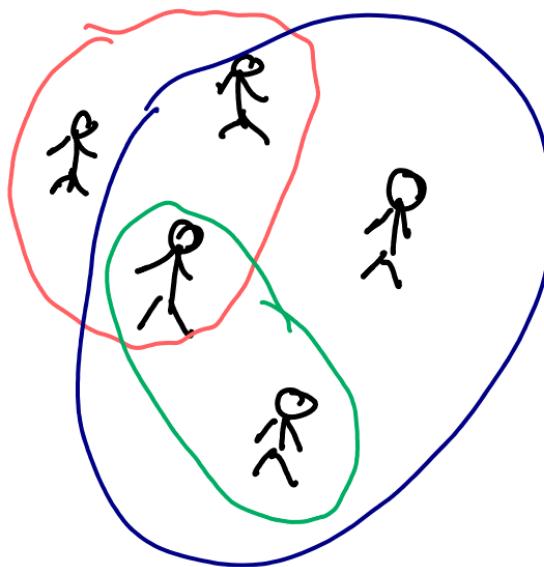
BIPARTITE
NET



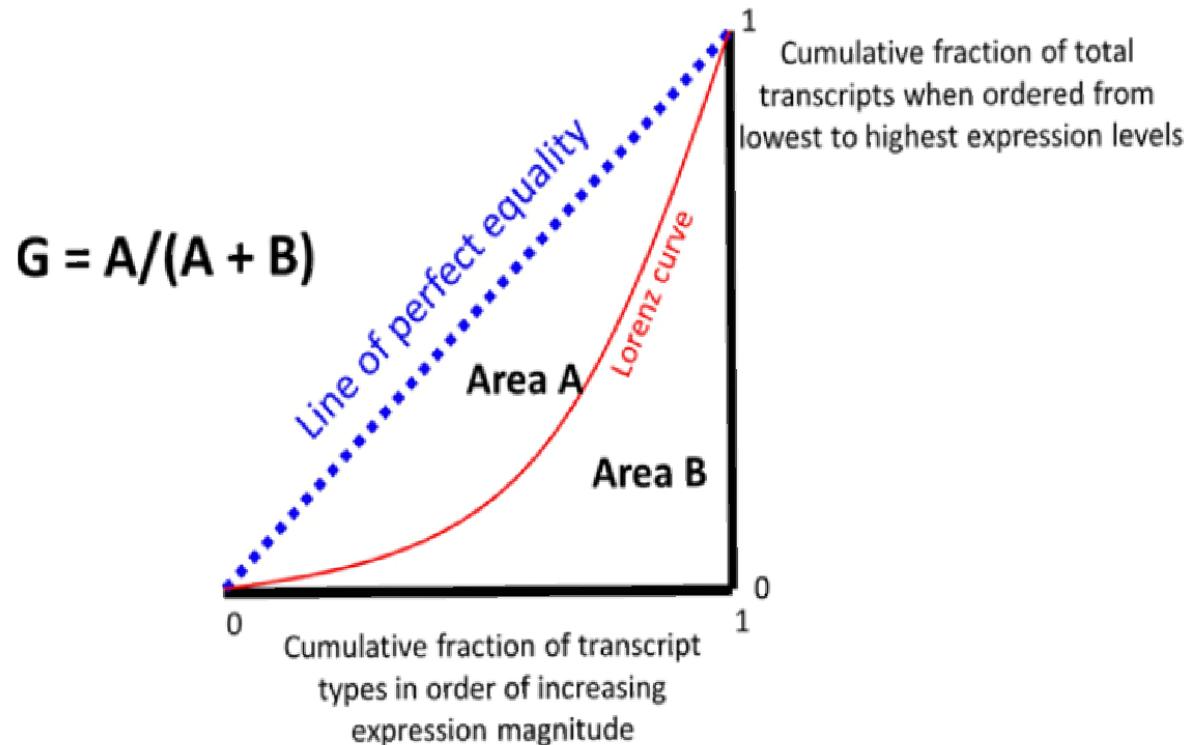
HIGHER ORDER
INTERACTIONS?

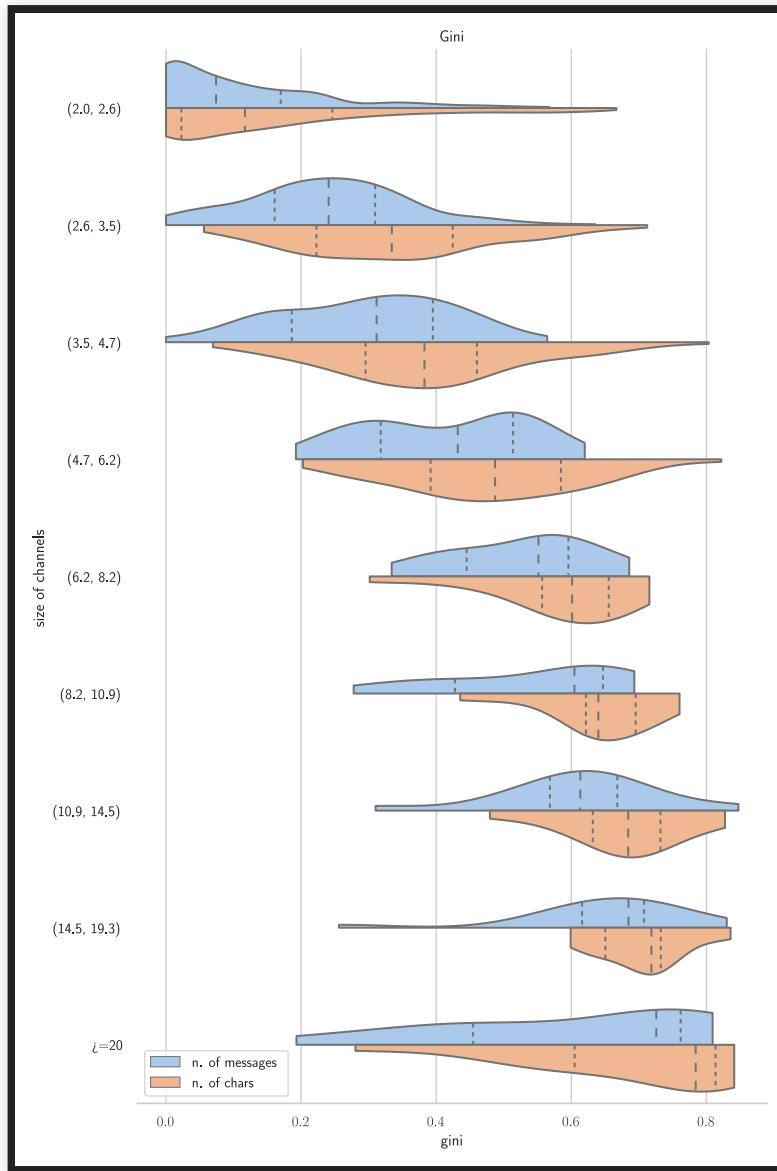
HYPERGRAPH

↔ 1-1 →



GINI AN INDEX COEFFICIENT AS OF (IN)EQUALITY





TO CONCLUDE...

WALKS