

Effective Learning Networks

The 'Groups Versus Networks' Argument Explained

Stephen Downes

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- Status of the Theory
- Elements of Networks
- Network Learning
- Networks Functionality
- Effective Networks

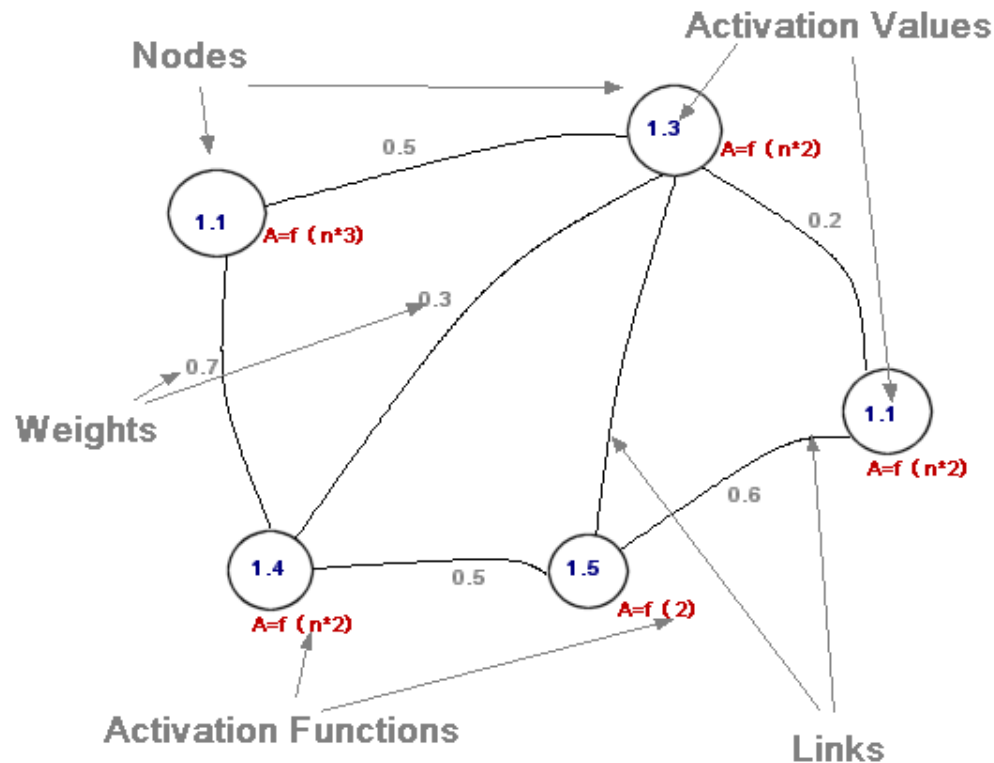
Status of the Theory

- Connectivism is an empirical theory intended to describe how learning occurs
- It is based in observations and evidence from a variety of related empirical theories:
 - connectionism, in computer science
 - associationism, in philosophy and psychology
 - graph theory, in mathematics
 - social network theory

- Connectivism doesn't have a 'message'
 - it doesn't require adherence or belief
 - it's not a political movement
- Connectivism doesn't argue, it *describes*
 - it is intended to describe the world as we see it
 - it explains why we are developing e-learning as a distributed and networked process
- It is relativistic, but not a free-for-all

Elements of Networks

- This is a review from an earlier week...

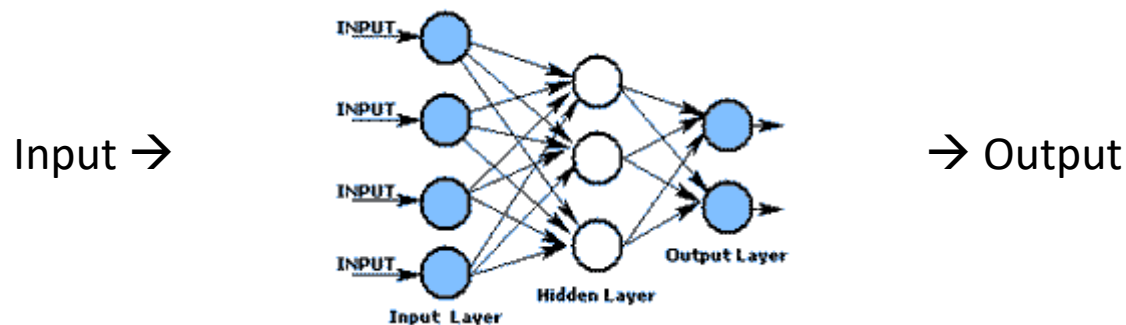


Network Learning

- ‘Knowledge’ in a network is the set of connections...
 - To ‘know’ P is not to have a characteristic set of connections that we can point to and say ‘This is knowing that P’
 - Rather, it is to have any of many possible sets of connections such that input characteristic of ‘P’ produces output characteristic of ‘knowing that P’

- ‘learning’ in a network is the development of the connections to produce knowledge
 - ‘plasticity’ – the idea that new connections may be formed, existing connections may be lost
 - ‘adjustment’ – the idea that connection *weights* may be adjusted
- ‘experience’ in a network is the activation of nodes through inputs
 - learning occurs as a result of experience

- Networks function through ‘spreading activation’ – ie., one node is activated, then another, etc.
- It is this activity that impacts plasticity or the adjustment of weights



perceiving → sensing, feeling, thinking, deciding → behaving

- Network Learning Mechanisms
 - Hebbian associative
 - Proximity / contiguity based
 - Back-propagation
 - Boltzmann - settling
- Note: whether a given system, or any system, uses these is an empirical matter
- Other mechanisms (eg. Selective attraction) may also be at work

Types of Networks

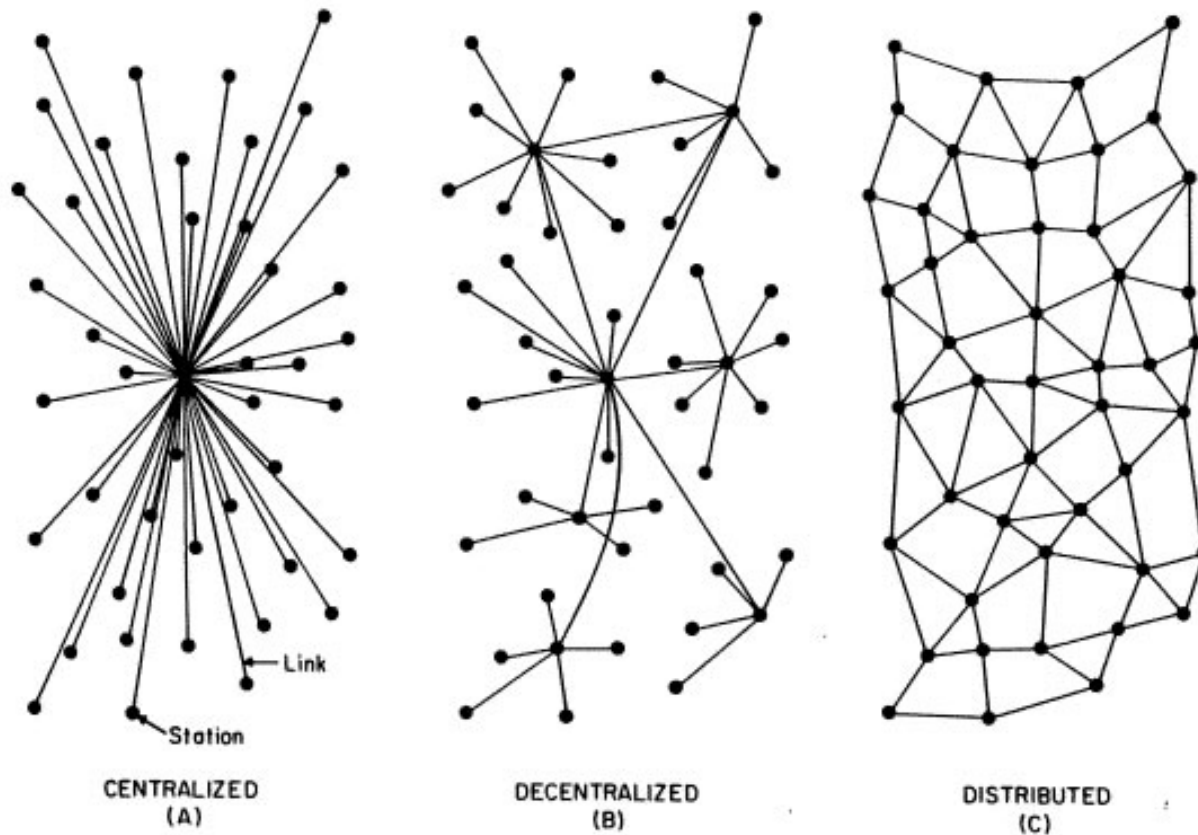
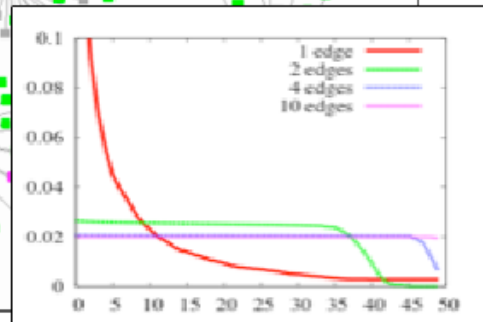
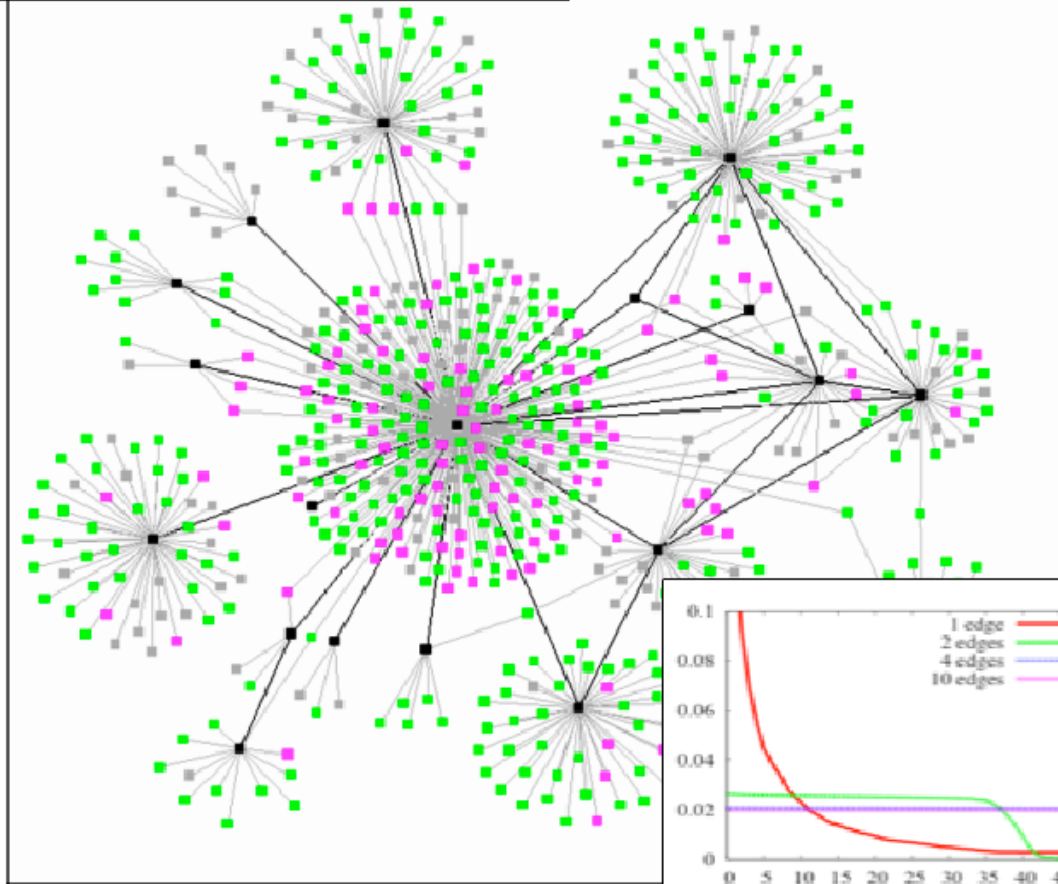


FIG. 1 – Centralized, Decentralized and Distributed Networks

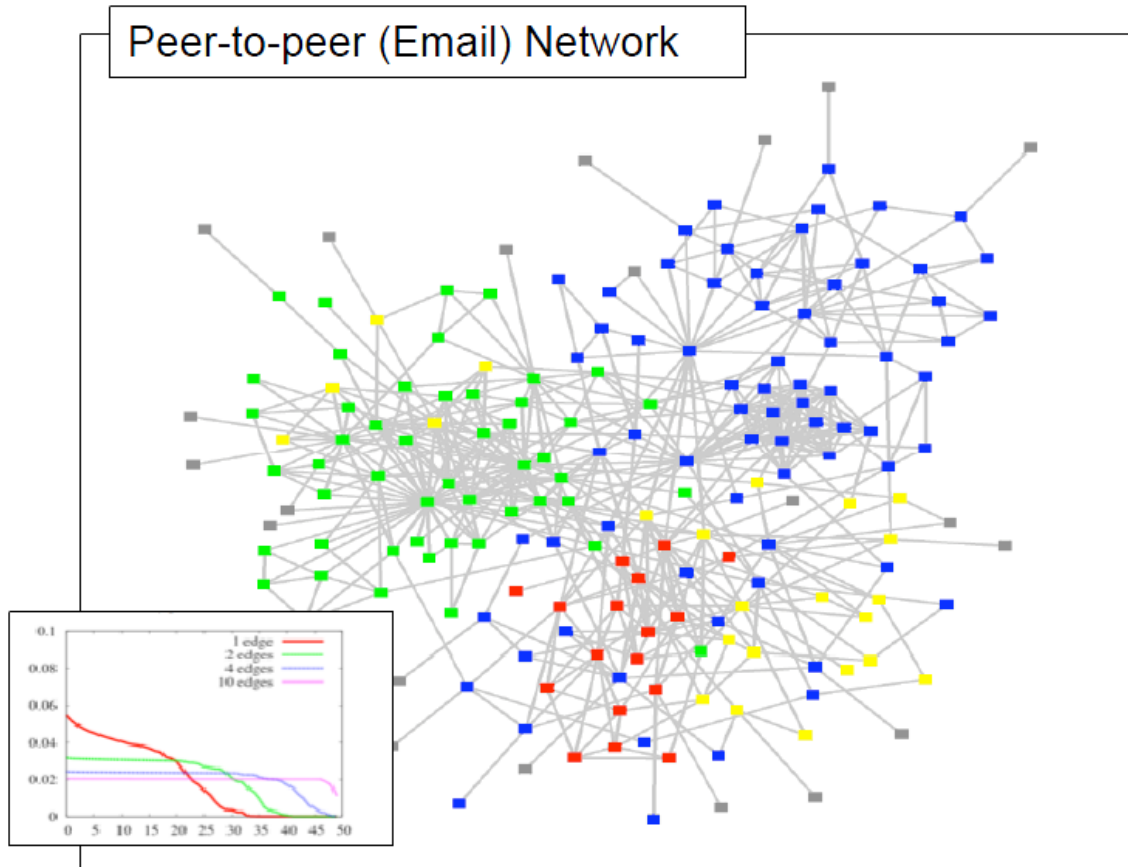
Network Structures - Tree

Traditional social network



Central
Influence
Power Law
Viral
Hierarchy

Network Structures - Mesh



Distributed
Discussion
Balanced
Reflective
Democracy

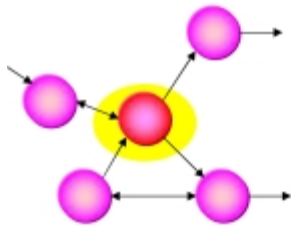
<http://www.daniel-lemire.com/fr/abstracts/DIVERSITY2008.html>

<http://www.mailchimp.com/blog/using-email-to-uncover-hidden-social-networks/>

Effective Networks

- Cascade Phenomena – what causes them?
What are the consequences?

A Node Feature Analysis



• **Centrality Analysis**

- Degree
- Betweenness
- Closeness
- k -core

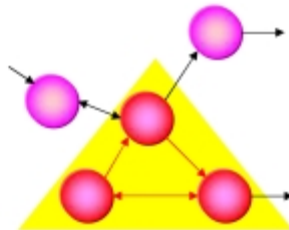
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• **Node Removing test**

- Shortest path length
- Articulation points

...

B Structural Properties

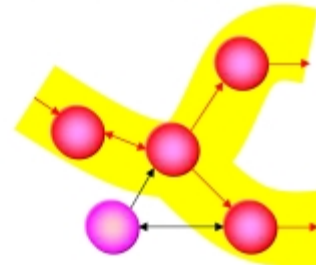


• **Structural Feature**

- Network density
- Clustering index
- Shortest path length
- k -cycle

....

C Characteristics of Pathways



• **Pathway Analysis**

- k -shortest path
- Equal length path

...

• **Network Similarity Analysis**

- Cosine correlation

...

TODAY

SMENESS

GROUP

NATION
LANGUAGE
RELIGION

FUTURE
AFFINITY

NETWORK

? POST-GROUP
ORGANIZATIONS

TV
RADIO
BOOK, NEWSPAPER
ALL-STAFF
EMAIL



ONE
WAY

SCHOOL
CLASS

Metallic - Elemental
UNITY → VISION STATEMENT

SOMETIMES EVEN: PURITY
MELTING POT

COORDINATION

LEADERS' COLLABORATION

GROUP VALUE
(= LEADER'S VALUE)

CLOSED

LEARNING OBJECTIVE
LEARNING DESIGN

MEMBERSHIP / IN-CAMERA

LOCK-IN

STANDARDS - JARGON

WALLS

COPYRIGHT
PATENTS

DISTRIBUTIVE

AKA TRICKLE DOWN

BROADCAST

★ STARS AND GURUS ★

CENTRALIZED

POWER - POWER LAWS

RICH

KNOWLEDGE,
LIKE MONEY,
FLOWS FROM
AUTHORITY



POOR

TALKING
TELEPHONE
PERSONAL
EMAIL



MANY
WAYS

Organic - Biological
DIVERSITY

SALAD BOWL

AUTONOMY

COOPERATION
EXCHANGE

MUTUAL VALUE

PERSONAL
LEARNING
ENVIRON.

PERSONAL
HOMEPAGE
BLOG

PORTFOLIO?
SELF-DIRECTED
LEARNING

RSS
HTML

OPENNESS

CONNECTION
PERSPECTIVE / CONTEXT

CC.
G.P.L.

BRIDGES

COMMUNITY OF
PRACTICE

IDENTITY

CONNECTIVE

CONVERSATION

DISTRIBUTED

DEMOCRACY

(OR: POST-DEMOCRACY)

→ KNOWLEDGE
EMERGES

SKYPE?
PODCAST?

BLOGLINES

CORPORATE
WEBSITE /
PORTAL

LEARNING
MANAGEMENT
SYSTEM

LEARNING OBJ. METADATA
MS-WORD

PASSWORDS
ENTERPRISE

PODCAST
VODCAST

TECHNOKRAT!

