

Narrating with Networks:

Making Sense of Event Log Data with Socio-technical Trajectories

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Northeastern University

CRCIS Lunch Seminar, February 10, 2014

@bkeegan

Scholars of socio-technical collaboration have overlooked the non-random structures emerging from the ***accumulation of contributions***.

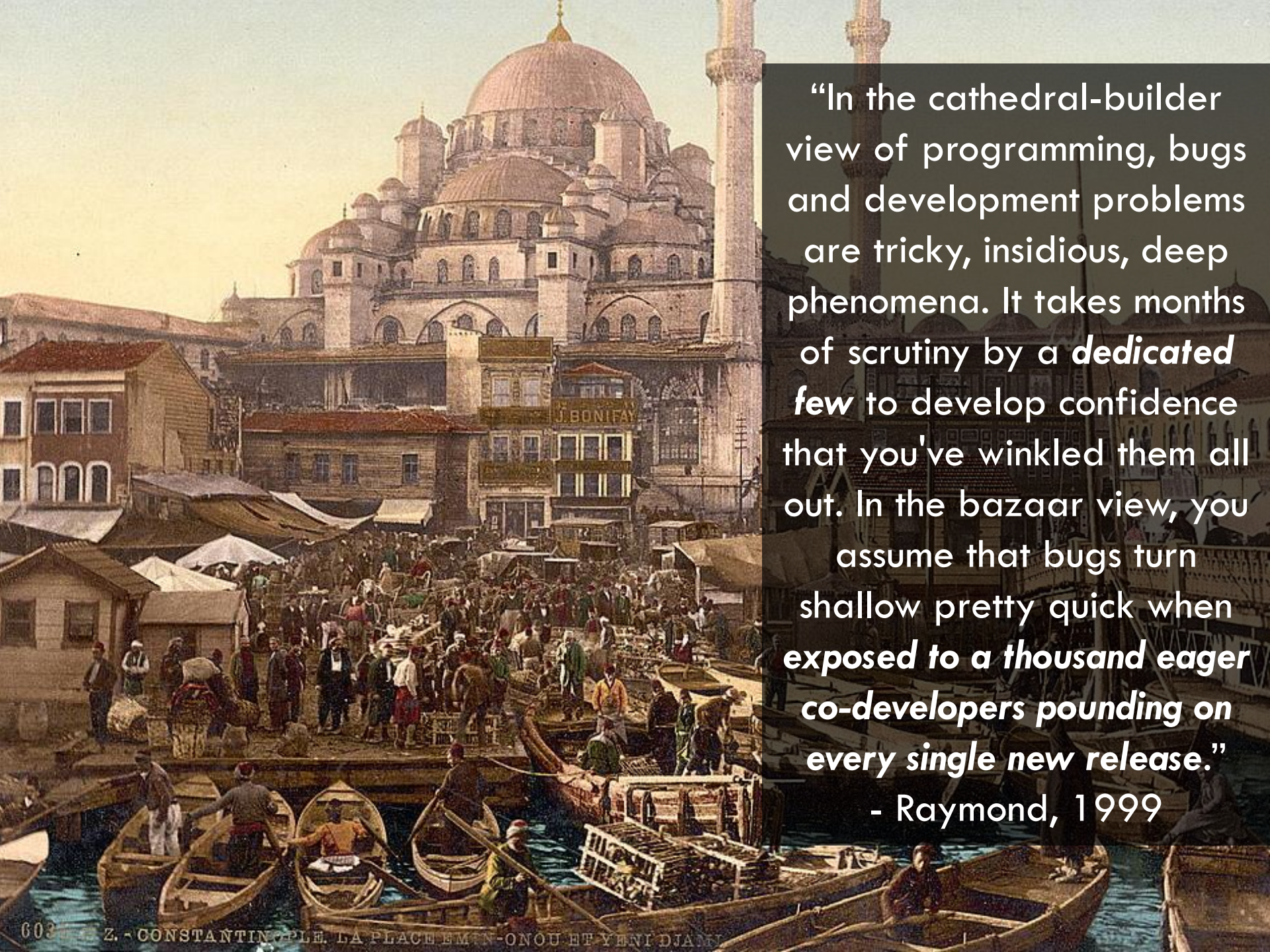
These accumulated contributions trace out ***trajectories of users and artifacts*** that can be understood with network analysis methods.

Trajectories are ***easy*** to compute, have ***complex*** structures and dynamics, and ***generalize*** across systems and levels of analysis.



“I believed that the important software needed to be ***built like cathedrals***,
...but the Linux community seemed to resemble a ***great babbling bazaar***
...out of which a coherent and stable system could seemingly emerge
only by a succession of miracles.”

- Raymond, 1999

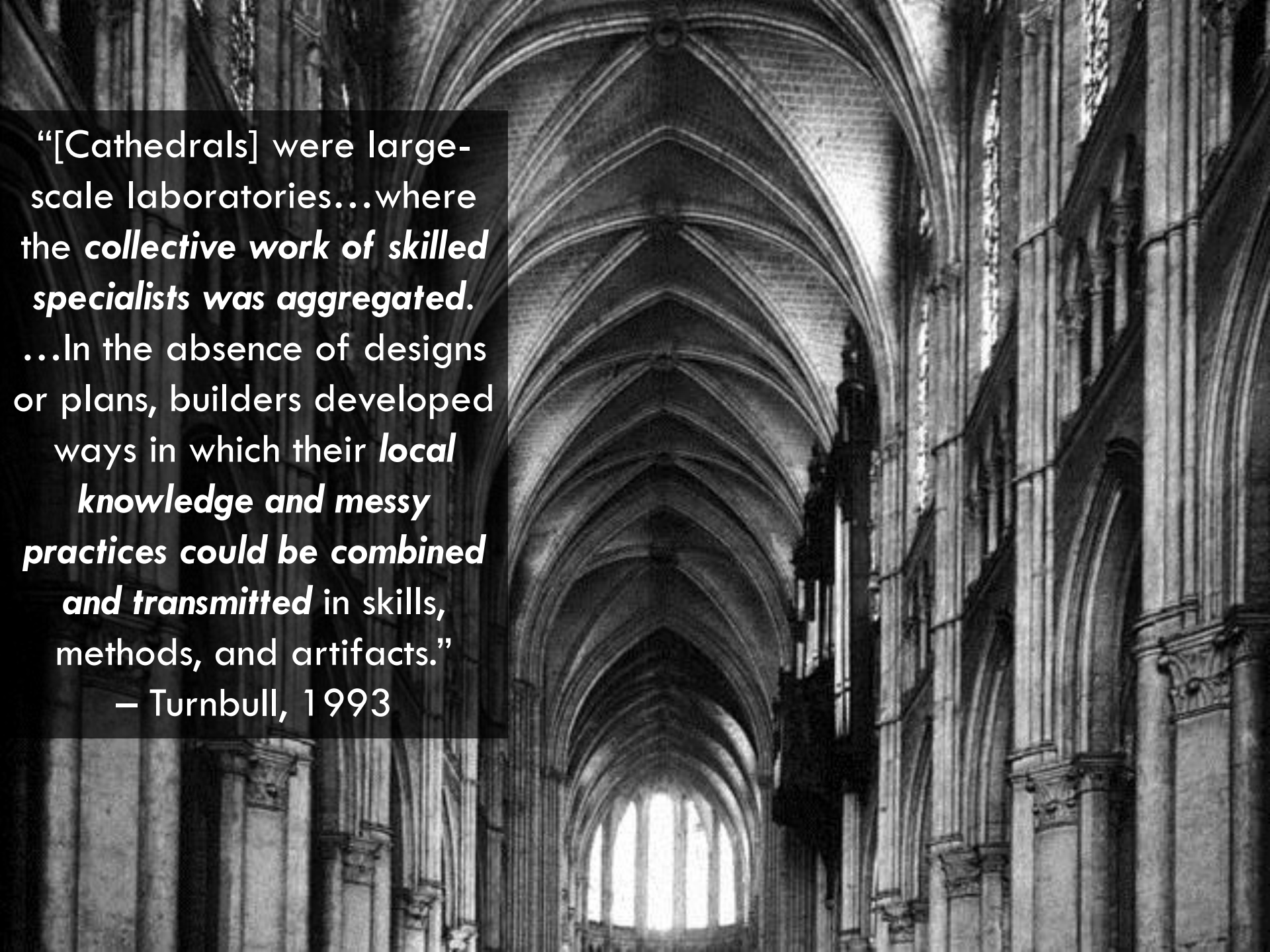


“In the cathedral-builder view of programming, bugs and development problems are tricky, insidious, deep phenomena. It takes months of scrutiny by a *dedicated few* to develop confidence that you've winkled them all out. In the bazaar view, you assume that bugs turn shallow pretty quick when *exposed to a thousand eager co-developers pounding on every single new release.*”

- Raymond, 1999

“There were nine different contractors who took between 25 and 30 years to build the cathedral in 30 distinct campaigns. There was no overall designer, just a succession of builders. Chartres was *the ad hoc accumulation of the work of many men.*” — Turnbull, 1993

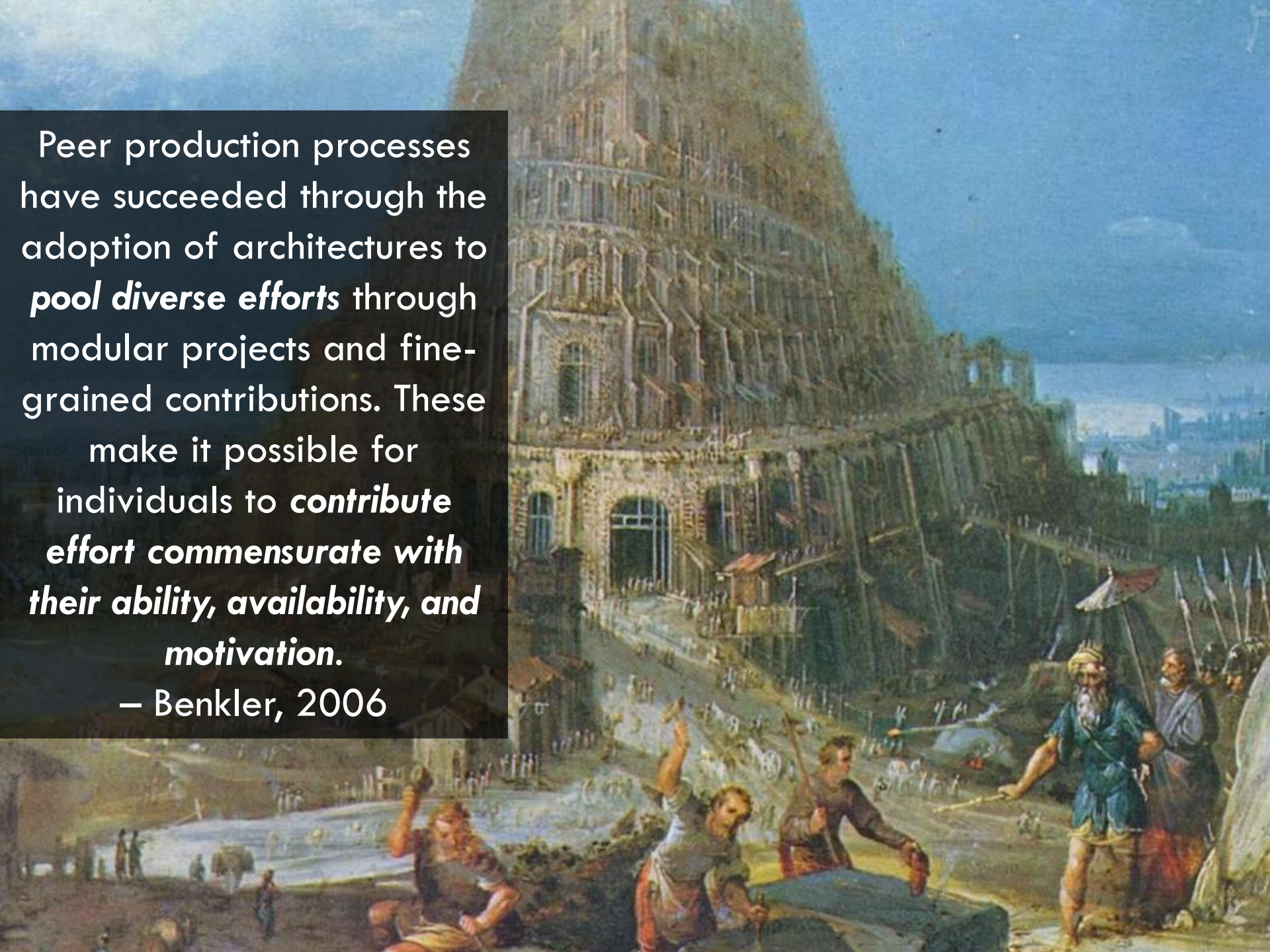


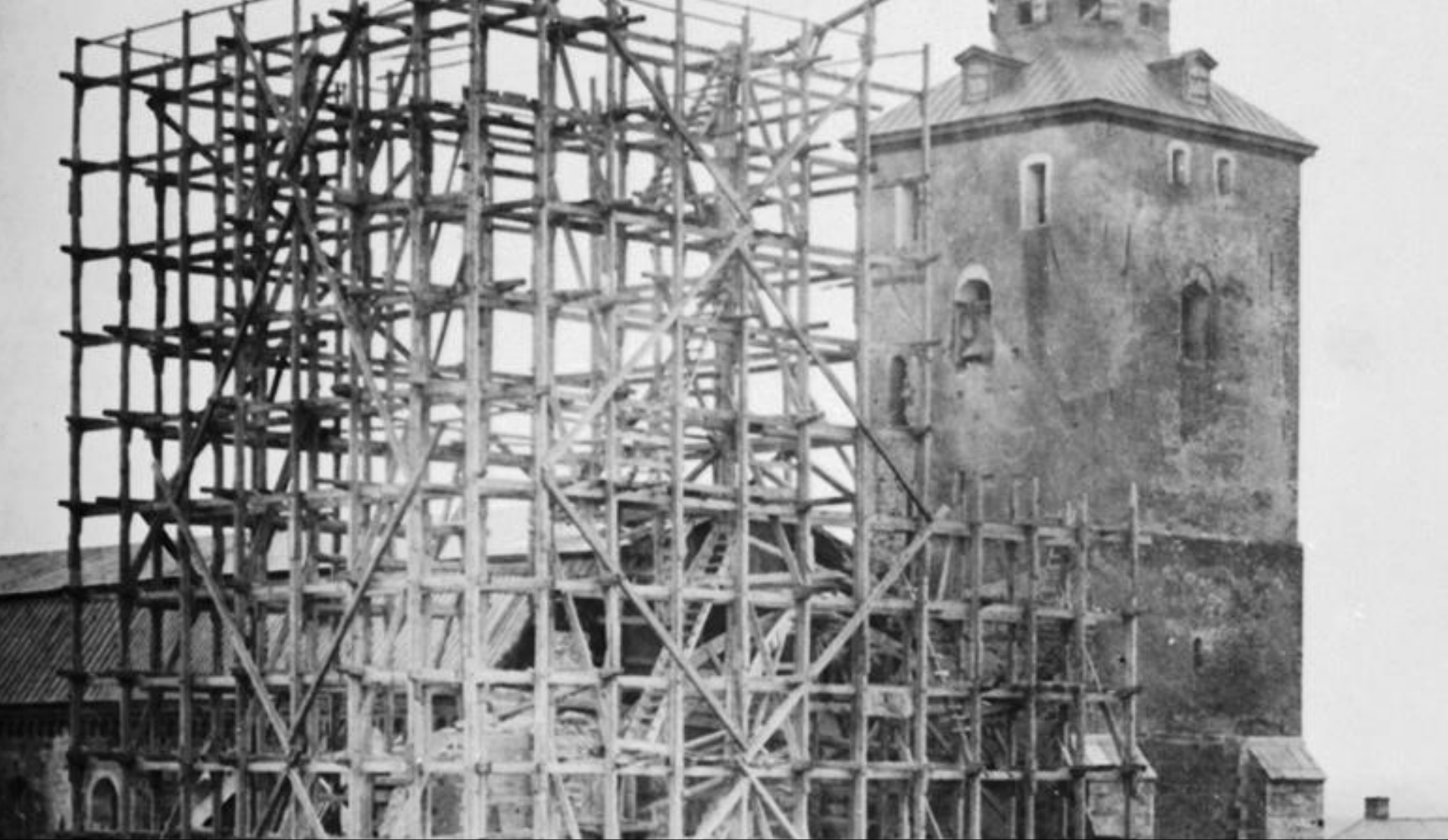


“[Cathedrals] were large-scale laboratories...where the ***collective work of skilled specialists was aggregated.*** ...In the absence of designs or plans, builders developed ways in which their ***local knowledge and messy practices could be combined and transmitted*** in skills, methods, and artifacts.”
— Turnbull, 1993

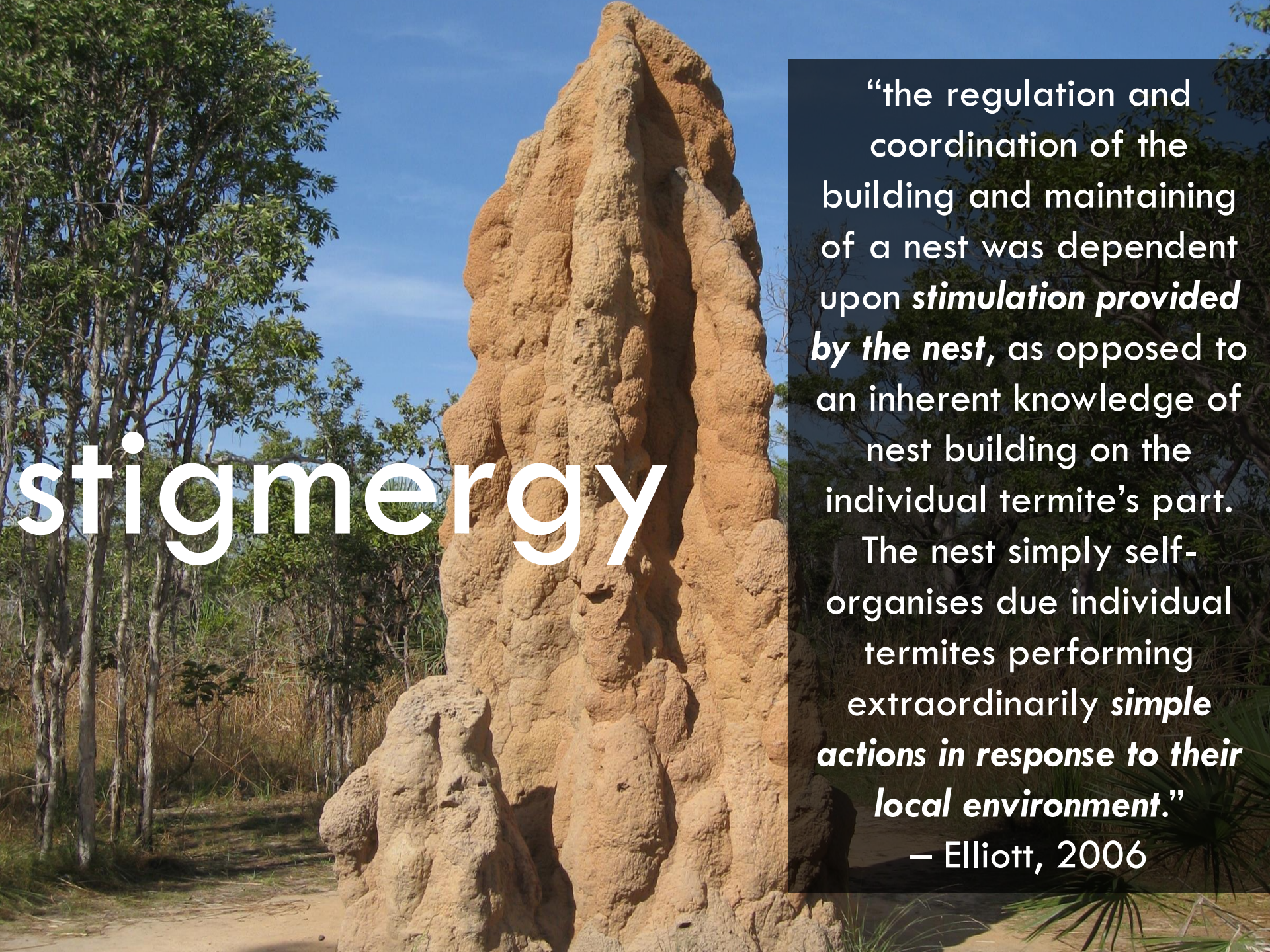
Peer production processes have succeeded through the adoption of architectures to ***pool diverse efforts*** through modular projects and fine-grained contributions. These make it possible for individuals to ***contribute effort commensurate with their ability, availability, and motivation.***

— Benkler, 2006





“A Wikipedia article is a process, not a product, and as a result it is never finished. *Every edit is itself provisional.* Every change is best thought of as a proposed edit... The process is more *like creating a coral reef, the sum of millions of individual actions...*” – Shirky, 2008



stigmergy

“the regulation and coordination of the building and maintaining of a nest was dependent upon *stimulation provided by the nest*, as opposed to an inherent knowledge of nest building on the individual termite’s part. The nest simply self-organises due individual termites performing extraordinarily *simple actions in response to their local environment.*”

— Elliott, 2006



“Stigmergy may unfold
in a human context
[when]... actors
coordinate and integrate
their cooperative efforts
*by acting directly on the
physical traces of work
previously accomplished by
others.* ...the modifications
made by individuals on
artifacts may become
*meaningful to others and in
turn inspire new action*”
– Christensen, 2012

RQ1: Do accumulations of contributions within socio-technical artifacts have complex structures? (***Structure***)

RQ2: What do these accumulations reveal about the dynamics of socio-technical collaborations? (***Dynamics***)

RQ3: How does this method generalize to other systems, accumulated user activity, etc.? (***Generalizability***)

Wikipedia

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(newest | **oldest**) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

- [\(cur | prev\)](#) ☒ 02:48, 2 February 2014 Whym (talk | contribs) . . (80,191 bytes) (+22) . . (→*External links: {{Authority control}}*) (undo | thank)
- [\(cur | prev\)](#) ☒ 16:26, 29 January 2014 Bahooka (talk | contribs) . . (80,169 bytes) (+54) . . (*update endowment*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:18, 27 January 2014 ElKevbo (talk | contribs) . . (80,115 bytes) (-133) . . (*not even close to being a reliable source*) (undo | thank)
- [\(cur | prev\)](#) ☐ 20:47, 27 January 2014 Jcfrommn (talk | contribs) **m** . . (80,248 bytes) (+133) . . (→*Teaching and learning*) (undo | thank)
- [\(cur | prev\)](#) ☐ 11:04, 26 January 2014 Biomedicinal (talk | contribs) . . (80,115 bytes) (+2) . . (*This statement fits exactly the organization of the following parts.*) (undo | thank)
- [\(cur | prev\)](#) ☐ 18:16, 20 January 2014 Monkbot (talk | contribs) **m** . . (80,113 bytes) (-6) . . (→*Endowment: Fix CS1 deprecated date parameter errors*) (undo)
- [\(cur | prev\)](#) ☐ 15:58, 20 January 2014 Biomedicinal (talk | contribs) . . (80,119 bytes) (-1,183) . . (→*University rankings: Removed what have already been summarized and provided by the template.*) (undo | thank)
- [\(cur | prev\)](#) ☐ 23:08, 18 January 2014 Rbcwa (talk | contribs) . . (81,302 bytes) (+271) . . (→*Colonial: Another printing press reference*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:55, 18 January 2014 Rbcwa (talk | contribs) **m** . . (81,031 bytes) (-2) . . (→*Colonial*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:53, 18 January 2014 Rbcwa (talk | contribs) . . (81,033 bytes) (-1) . . (→*Colonial*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:48, 18 January 2014 Rbcwa (talk | contribs) . . (81,034 bytes) (-1) . . (→*Colonial: fix reference title*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:47, 18 January 2014 Rbcwa (talk | contribs) . . (81,035 bytes) (+9) . . (→*Colonial*) (undo | thank)
- [\(cur | prev\)](#) ☐ 21:45, 18 January 2014 Rbcwa (talk | contribs) . . (81,026 bytes) (+364) . . (→*Colonial*) (undo | thank)
- [\(cur | prev\)](#) ☐ 06:39, 10 January 2014 Bgwhite (talk | contribs) . . (80,662 bytes) (-20) . . (*WP:CHECKWIKI error fix #69. ISBN problem. Do general fixes and cleanup if needed. - using AWB (9838)*) (undo | thank)

GitHub

branch: 3.0.0-wip ▾

bootstrap / Commits

Aug 14, 2013



Merge pull request #9463 from PMPP/css-ex-fix ...

cvrebert authored 7 hours ago



1fd51b0fa3 +

Browse code ➔



CSS Grid old classes in use

PMPP authored 7 hours ago

1800edc07c +

Browse code ➔



rm `action` attr from highlighted example code too ...

cvrebert authored 9 hours ago

aa2c152d85 +

Browse code ➔

Aug 13, 2013



tweak punctuation in sentence of docs

cvrebert authored 11 hours ago

13d2616631 +

Browse code ➔



Merge pull request #9451 from Luis-TP/3.0.0-wip ...

mdo authored 12 hours ago

9d82a8ba1f +

Browse code ➔



Apply mixin to correct class

Luis-TP authored 13 hours ago

c79fa6ad04 +

Browse code ➔



Fix .navbar-right > .dropdown-menu alignment

Luis-TP authored 13 hours ago

e29c2d0c24 +

Browse code ➔



Merge pull request #9443 from mattleff/patch-1 ...

66122fa153 +

Reddit

↑
21880
↓



test post please ignore (self.pics)

submitted 4 years ago by qgyh2

1746 comments share save hide report

top 200 comments show 500

sorted by: top ▼

↑ [-] **Kharos** 6350 points 4 years ago

↓ Don't tell me what to do! Upvoted.

[permalink](#)

↑ [-] **[deleted]** 1578 points 4 years ago*

↓ This must become the highest rated test post of all time.

Edit: Holy fuck, I think we did it.

[permalink](#) [parent](#)

↑ [-] **happywaffle** 419 points 4 years ago*

↓ There was one maybe a year ago that got the highest vote total I'd ever seen. One Cheeto to the person who finds it.

EDIT: I guess everyone gets a Cheeto.

[permalink](#) [parent](#)

↑ [-] **mrhomer** 203 points 4 years ago*

↓ [this](#) is what we would have to surpass to get the highest vote total ever...

EDIT: good job guys. we won

[permalink](#) [parent](#)

↑ [-] **stingraycharles** 179 points 4 years ago

↓ That must be the first US president who wins with only 8,500 votes!

[permalink](#) [parent](#)

↑ [-] **Teifion** 142 points 4 years ago

↓ We could just downvote that submission.

[permalink](#) [parent](#)

Features of an event log

- **Activity** – *a system action*
 - Commit, revision, comment
- **Case** – *an entity that is acted upon*
 - Repository, Wikipedia article, discussion thread
- **Performer** – *an entity executing actions*
 - User, editor, member
- **Order** – *an index defining a sequence*
 - Timestamp, position, thread depth

Activity	Case	Performer	Order
Commit	X	A	1:01
Commit	X	B	2:02
Commit	X	C	3:03
Commit	X	A	4:04
Commit	X	D	5:05
Commit	X	A	6:06

Software systems as complex networks:

structure, function, and evolvability of software collaboration graphs

Socialization in an Open Source Software

Community: A Socio-Technical Analysis

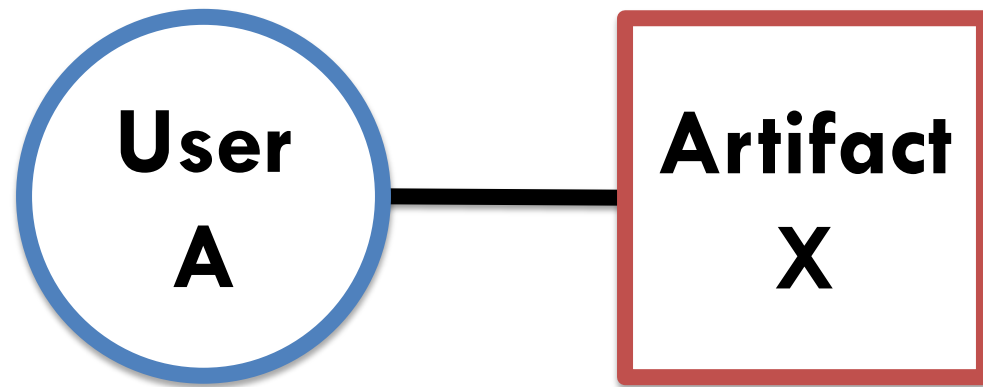
**Social and Temporal Structures in
Everyday Collaboration**

Self-Organization and Hierarchy in Open Source Social Networks

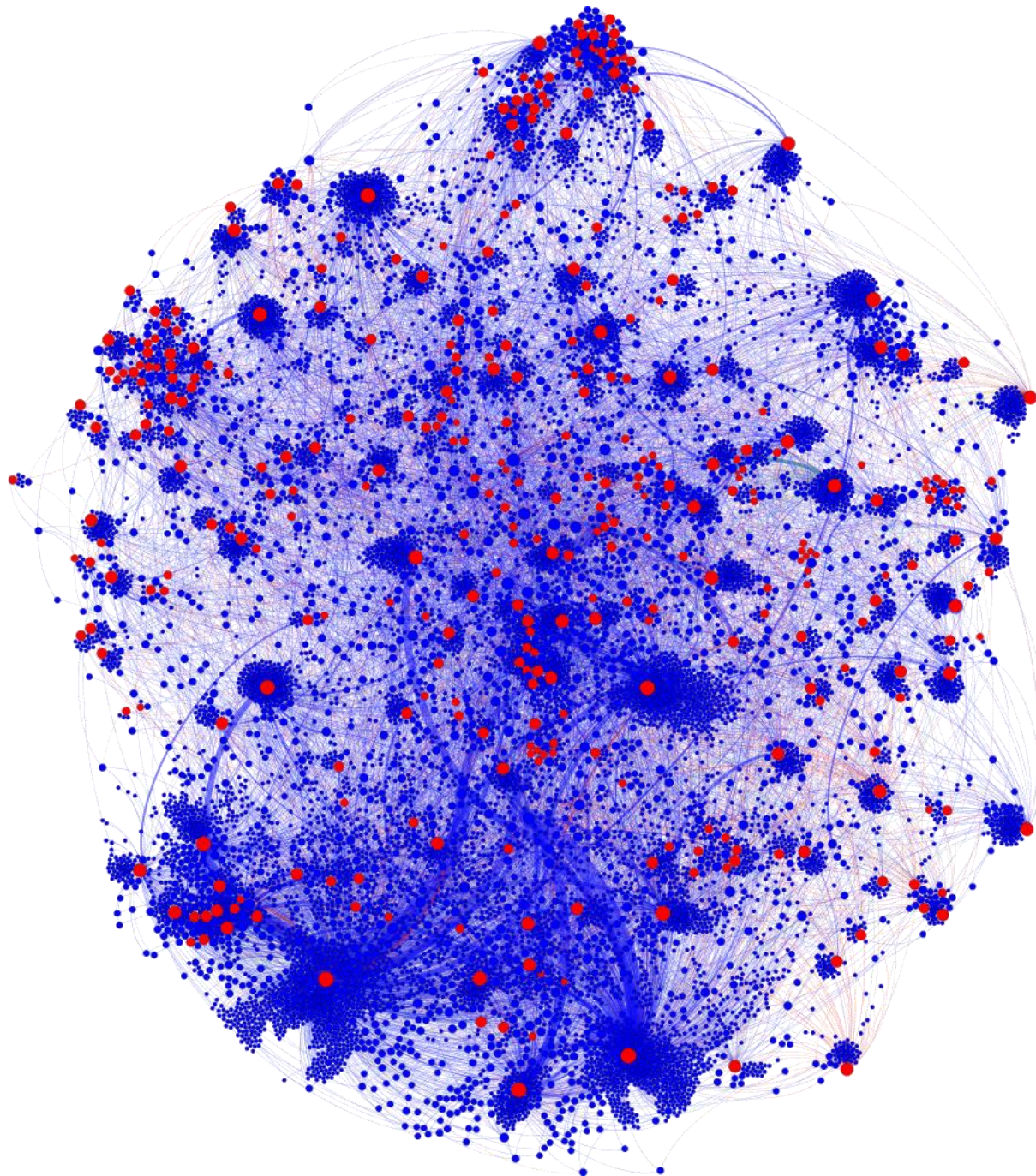
**Evolution Patterns of Open-Source Software Systems and
Communities**

**A TOPOLOGICAL ANALYSIS OF THE OPEN SOURCE SOFTWARE DEVELOPMENT
COMMUNITY**

Who works on what artifacts?

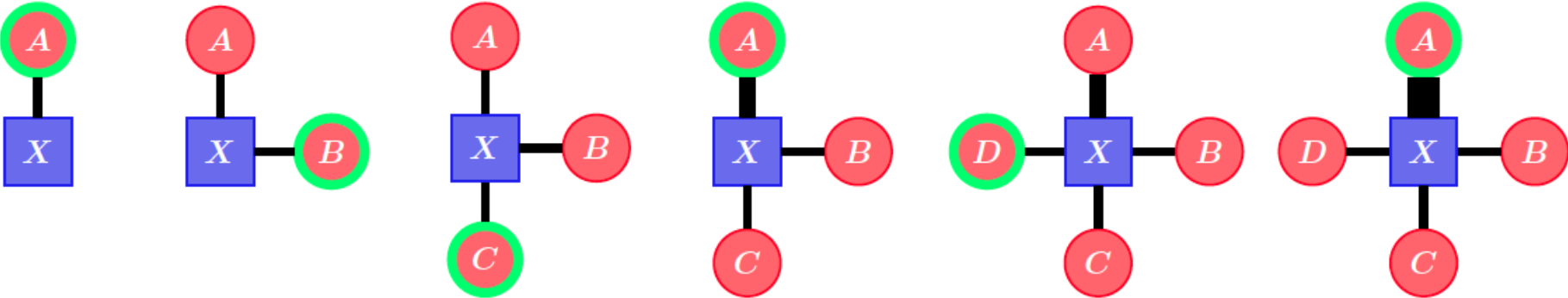


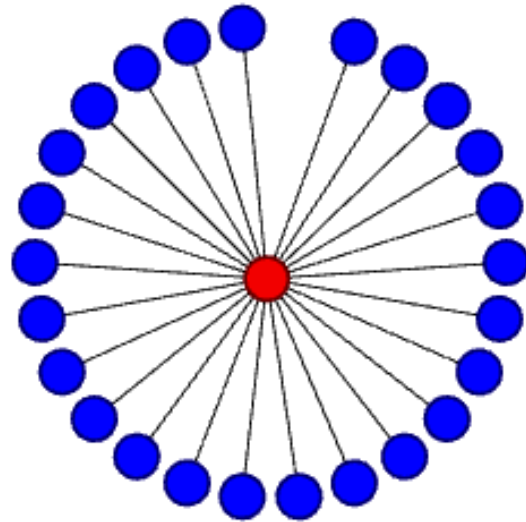
“User A contributes to Artifact X”



Artifacts
Users

Activity	Case	Performer	Order
Commit	X	A	1:01
Commit	X	B	2:02
Commit	X	C	3:03
Commit	X	A	4:04
Commit	X	D	5:05
Commit	X	A	6:06





SEQUENCE ANALYSIS: New

Methods for Old Ideas

**SEQUENCES AND CYCLES IN
SOCIAL INTERACTION**

**STRATEGIES FOR THEORIZING FROM
PROCESS DATA**

**NARRATIVE EXPLANATION: An Alternative
to Variable-Centered Explanation?**

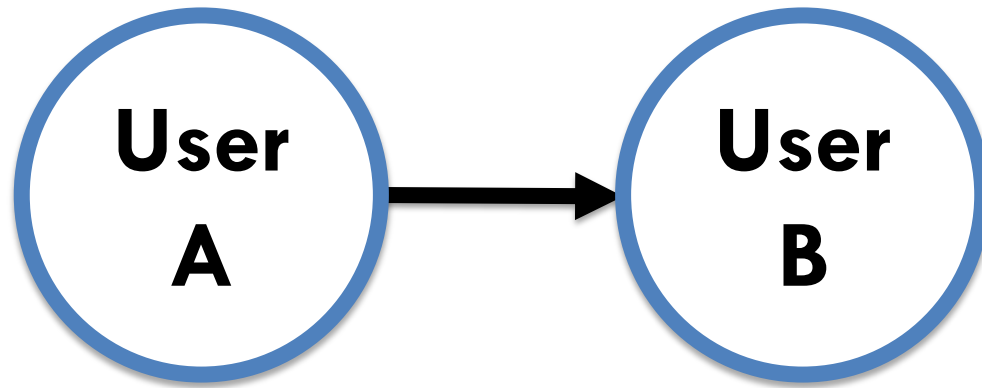
Becoming a Nazi: A model for narrative networks[☆]

Narrative Networks: Patterns of
Technology and Organization

**Taking Turns and Talking Ties: Networks
and Conversational Interaction¹**

Discovering Social Networks from Event Logs

Who modifies whose work?



“User B modified User A’s version”

Boston Marathon bombings: Difference between revisions

From Wikipedia, the free encyclopedia

Coordinates:  42°20′59.46″N 71°4′43.93″W﻿ / ﻿

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Revision as of 16:39, 24 July 2013 ([edit](#))

[Kennvido](#) ([talk](#) | [contribs](#))

([→Injuries](#): *last person to leave hospital*)

[← Previous edit](#)

[\[restore this version\]](#)

Revision as of 04:29, 25 July 2013 ([edit](#)) ([undo](#)) ([thank](#))

[Apteva](#) ([talk](#) | [contribs](#))

([→Injuries](#): *caps*)

[Next edit](#) [→](#)

Line 200:

During a firefight with the suspects just after midnight on April 19, 33-year-old MBTA Police Officer Richard H. Donohue Jr. was critically wounded.<ref name="AutoLC-28"/> He lost much blood and his heart stopped for 45 minutes, during which time he was kept alive by [[CPR|cardiopulmonary resuscitation]].<ref name="AutoQU-16"/>

Marc Fucarile, who lost his right leg and suffered severe burns and shrapnel wounds, was the last victim to leave the hospital on July 24, 2013.<ref>{{cite web|title=**LAST**

HOSPITALIZED MARATHON VICTIM HEADS

HOME|url=http://bigstory.ap.org/article/last-hospitalized-marathon-victim-heads-homelpublisher=AP|accessdate=24 July 2013}}</ref>

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Hospitalized Marathon Victim Heads Home|url=http://bigstory.ap.org/article/last-hospitalized-marathon-victim-heads-homelpublisher=AP|accessdate=24 July 2013}}</ref>

Merge pull request #9489 from BBosman/ol-breadcrumb

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OL breadcrumbs

🔗 3.0.0-wip



mdo authored an hour ago

commit b9620a1d5e519d1befd14f811c91b87f3c49f00b

2 parents 518c324 + c4568e4

Showing 1 changed file with 8 additions and 8 deletions.

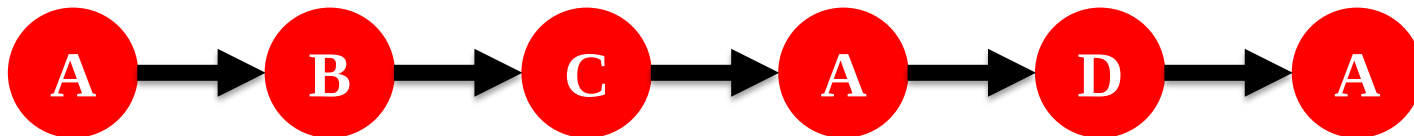
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16 components.html

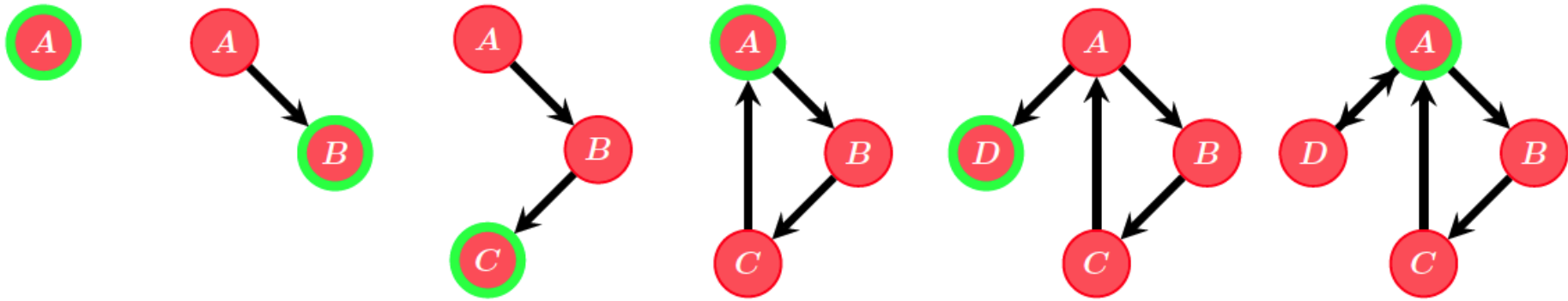
[View file @ b9620a1](#)

...	...	@@ -1445,25 +1445,25 @@	<h1 id="breadcrumbs">Breadcrumbs <small></small></h1>
1445	1445		<p class="lead">Indicate the current page's location within a navigational hierarchy.</p>
1446	1446		Separators are automatically added in CSS through <code>:before</code> and <code>content</code>.
1447	1447		<div class="bs-example">
1448		-	<ul class="breadcrumb">
	1448	+	<ol class="breadcrumb">
1449	1449		<li class="active">Home
1450		-	
1451		-	<ul class="breadcrumb">
	1450	+	
	1451	+	<ol class="breadcrumb">

Activity	Case	Performer	Order
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Commit	X	C	3:03
Commit	X	A	4:04
Commit	X	D	5:05
Commit	X	A	6:06



Activity	Case	Performer	Order
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2011 Tōhoku earthquake and tsunami

From Wikipedia, the free encyclopedia

Coordinates: 38.322°N 142.369°E﻿ / ﻿38.322°N 142.369°E﻿ / 38.322; 142.369

"2011 Miyagi earthquake" redirects here. For the aftershock that occurred on 7 April, see [April 2011 Miyagi earthquake](#).

The **2011 earthquake off the Pacific coast of Tōhoku** (東北地方太平洋沖地震 **Tōhoku-chihō Taiheiyō Oki Jishin**^[?], often referred to in Japan as the **Great East Japan Earthquake** (東日本大震災 **Higashi nihon daishinsai**^[?][9][10][fn 1] and also known as the **2011 Tohoku earthquake**,^[11] and the **3.11 Earthquake**, was a magnitude 9.0 (*M_w*) **undersea megathrust earthquake** off the coast of [Japan](#) that occurred at 14:46 JST (05:46 UTC) on Friday 11 March 2011,^[2][3][12] with the **epicentre** approximately 70 kilometres (43 mi) east of the [Oshika Peninsula](#) of [Tōhoku](#) and the **hypocenter** at an underwater depth of approximately 30 km (19 mi).^[2][13] It was the most powerful known **earthquake ever to have hit Japan**, and the fifth **most powerful earthquake in the world** since modern record-keeping began in 1900.^[12][14][15] The earthquake triggered powerful **tsunami** waves that reached heights of up to 40.5 metres (133 ft) in [Miyako](#) in [Tōhoku's Iwate Prefecture](#),^[16][17] and which, in the [Sendai](#) area, travelled up to 10 km (6 mi) inland.^[18] The earthquake moved [Honshu](#) (the main island of Japan) 2.4 m (8 ft) east and shifted the Earth on its axis by estimates of between 10 cm (4 in) and 25 cm (10 in).^[19][20][21] and generated sound waves detected by the low orbiting [GOCE](#) satellite.^[22]

On 12 September 2012, a Japanese [National Police Agency](#) report confirmed 15,883 deaths,^[23] 6,150 injured,^[24] and 2,643 people missing^[25] across twenty [prefectures](#), as well as 129,225 buildings totally collapsed, with a further 254,204 buildings 'half collapsed', and another 691,766 buildings partially damaged.^[26] The earthquake and tsunami also caused extensive and severe structural damage in north-eastern Japan, including heavy damage to roads and railways as well as fires in many areas, and a dam collapse.^[18][27] Japanese Prime Minister Naoto Kan said, "In the 65 years after the end of World War II, this is the toughest and the most difficult crisis for Japan."^[28] Around 4.4 million households in northeastern Japan were left without electricity and 1.5 million without water.^[29]

The tsunami caused **nuclear accidents**, primarily the **level 7+ meltdowns** at three reactors in the [Fukushima Daiichi Nuclear Power Plant](#) complex, and the associated evacuation zones affecting hundreds of thousands of residents.^[30][31] Many electrical generators were taken down, and at least three nuclear reactors **suffered explosions** due to hydrogen gas that had built up within their outer containment buildings after cooling system failure. Residents within a 20 km (12 mi) radius of the Fukushima Daiichi Nuclear Power Plant and a 10 km (6.2 mi) radius of the [Fukushima Daini Nuclear Power Plant](#) were evacuated. In addition, the U.S. recommended that its citizens evacuate up to 80 km (50 mi) of the plant.^[32]

Early estimates placed insured losses from the earthquake alone at US\$14.5 to \$34.6 billion.^[33] The [Bank of Japan](#) offered ¥15 trillion (US\$183 billion) to the banking system on 14 March in an effort to normalize market conditions.^[34] The [World Bank's](#) estimated economic cost was US\$235 billion, making it the costliest natural disaster in world history.^[35][36]

2011 Hi

240px

Date	11 March 2011
Origin time	14:46:23 JST (UTC+09:00)
Duration	6 minutes ^{[1]}
Magnitude	9.0 (<i>M_w</i>) ^{[2]} [3]
Depth	30 km (19 mi)
Epicenter	 38.322°N 142.369°E﻿ / ﻿38.322°N 142.369°E﻿ / 38.322; 142.369
Type	Megathrust earthquake
Countries or regions	Japan (primary) Pacific Rim (tsunami, secondary)
Total damage	Tsunami wave, flooding, landslides, fires, building and infrastructure damage, nuclear incidents including radiation releases
Max. intensity	IX - Violent
Peak acceleration	2.99 <i>g</i>
Tsunami	Up to 40.5 m (133 ft) in Miyako , Iwate , Tōhoku
Landslides	Yes
Foreshocks	7
Aftershocks	10,443 (as of 5 January 2014) ^{[4]}
Casualties	15,883 deaths, ^{[5]} 6,150 injured, ^{[6]} 2,643 people missing ^{[7]}



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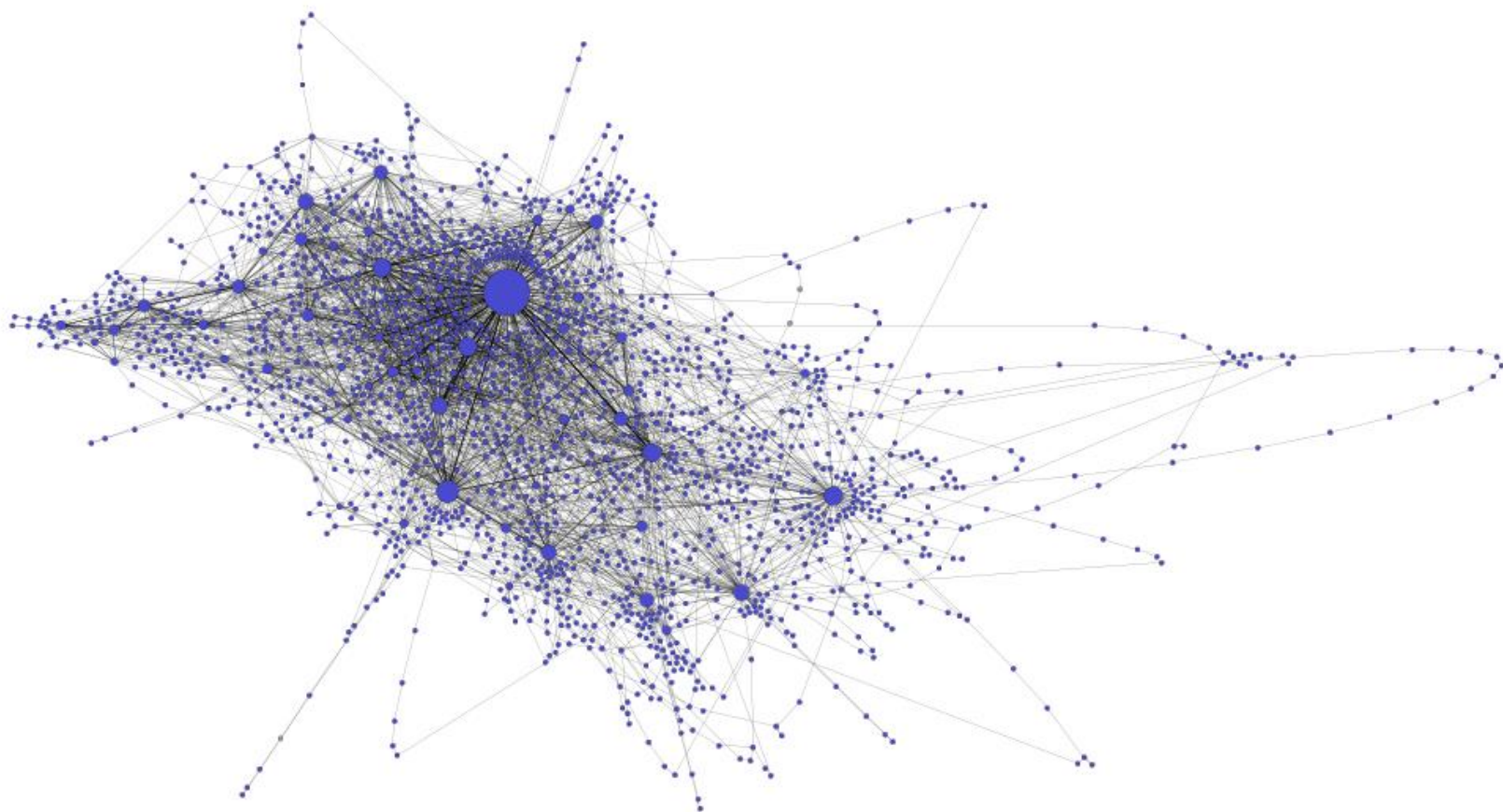
([newest](#) | [oldest](#)) [View](#) ([newer 20](#) | [older 20](#)) ([20](#) | [50](#) | [100](#) | [250](#) | [500](#))

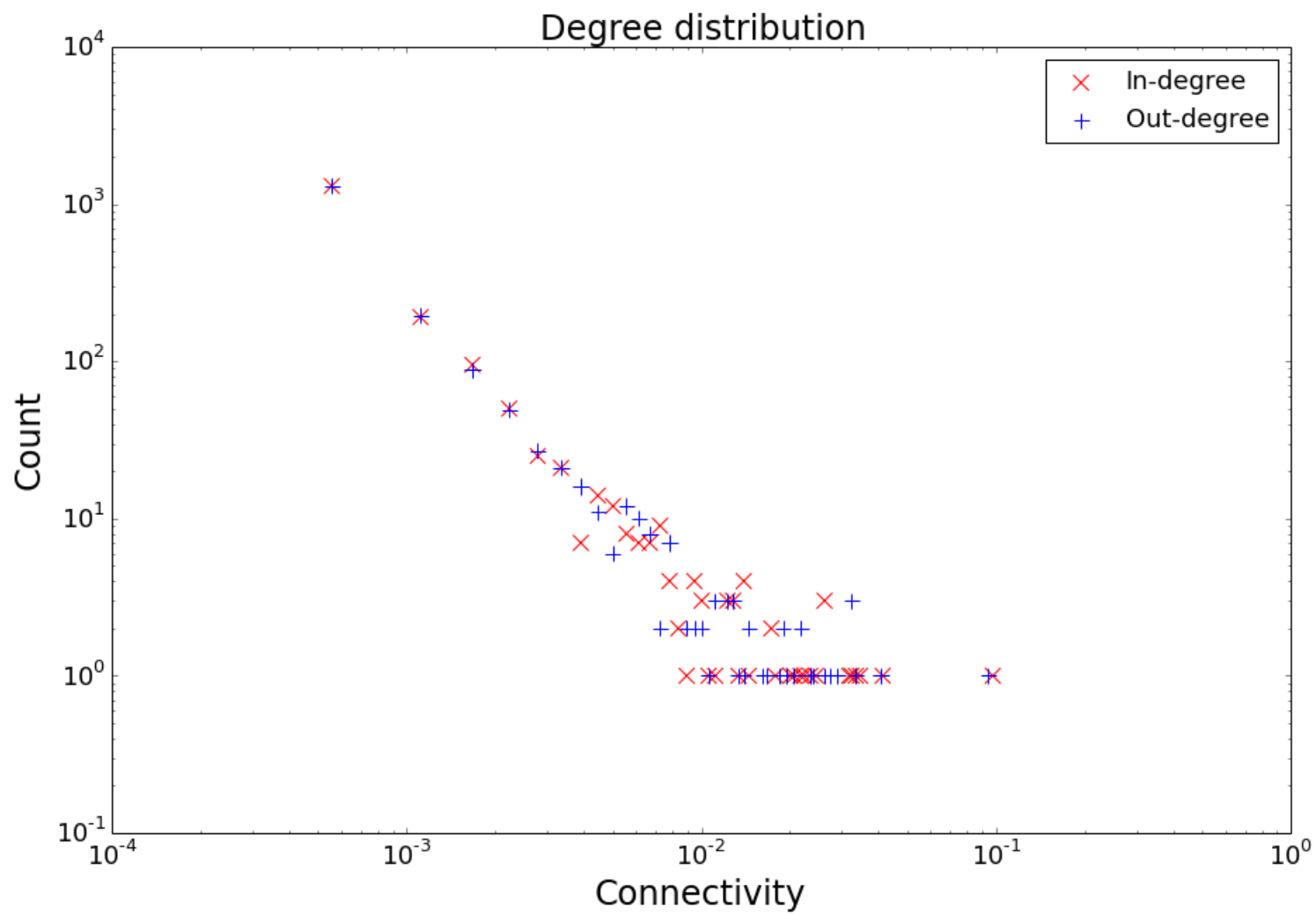
- | | | | | | |
|--|----------------------------------|----------------------|--|-------------------------|---|
| cur prev | ☒ | 07:01, 11 March 2011 | Dylan Thurston (talk contribs) | .. (2,195 bytes) (0) | .. (undo thank) |
| cur prev | ☒ | 07:01, 11 March 2011 | Joe Decker (talk contribs) | .. (2,195 bytes) (+6) | .. (→Tsunami: cn) (undo thank) |
| cur prev | ☐ | 07:00, 11 March 2011 | 75.84.122.110 (talk) | .. (2,189 bytes) (+27) | .. (undo) |
| cur prev | ☐ | 07:00, 11 March 2011 | Sp33dyphil (talk contribs) | .. (2,162 bytes) (-12) | .. (→The earthquake) (undo thank) |
| cur prev | ☐ | 07:00, 11 March 2011 | 203.59.75.243 (talk) | .. (2,174 bytes) (0) | .. (undo) |
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| cur prev | ☐ | 06:57, 11 March 2011 | 98.151.43.68 (talk) | .. (1,941 bytes) (+79) | .. (undo) |
| cur prev | ☐ | 06:57, 11 March 2011 | 203.59.75.243 (talk) | .. (1,862 bytes) (+1) | .. (→Tsunami) (undo) |
| cur prev | ☐ | 06:56, 11 March 2011 | 203.59.75.243 (talk) | .. (1,861 bytes) (+91) | .. (undo) |
| cur prev | ☐ | 06:56, 11 March 2011 | Pristino (talk contribs) | .. (1,770 bytes) (-18) | .. (undo thank) |
| cur prev | ☐ | 06:56, 11 March 2011 | Nanobear (talk contribs) | .. (1,788 bytes) (+298) | .. (→Tsunami: add) (undo thank) |

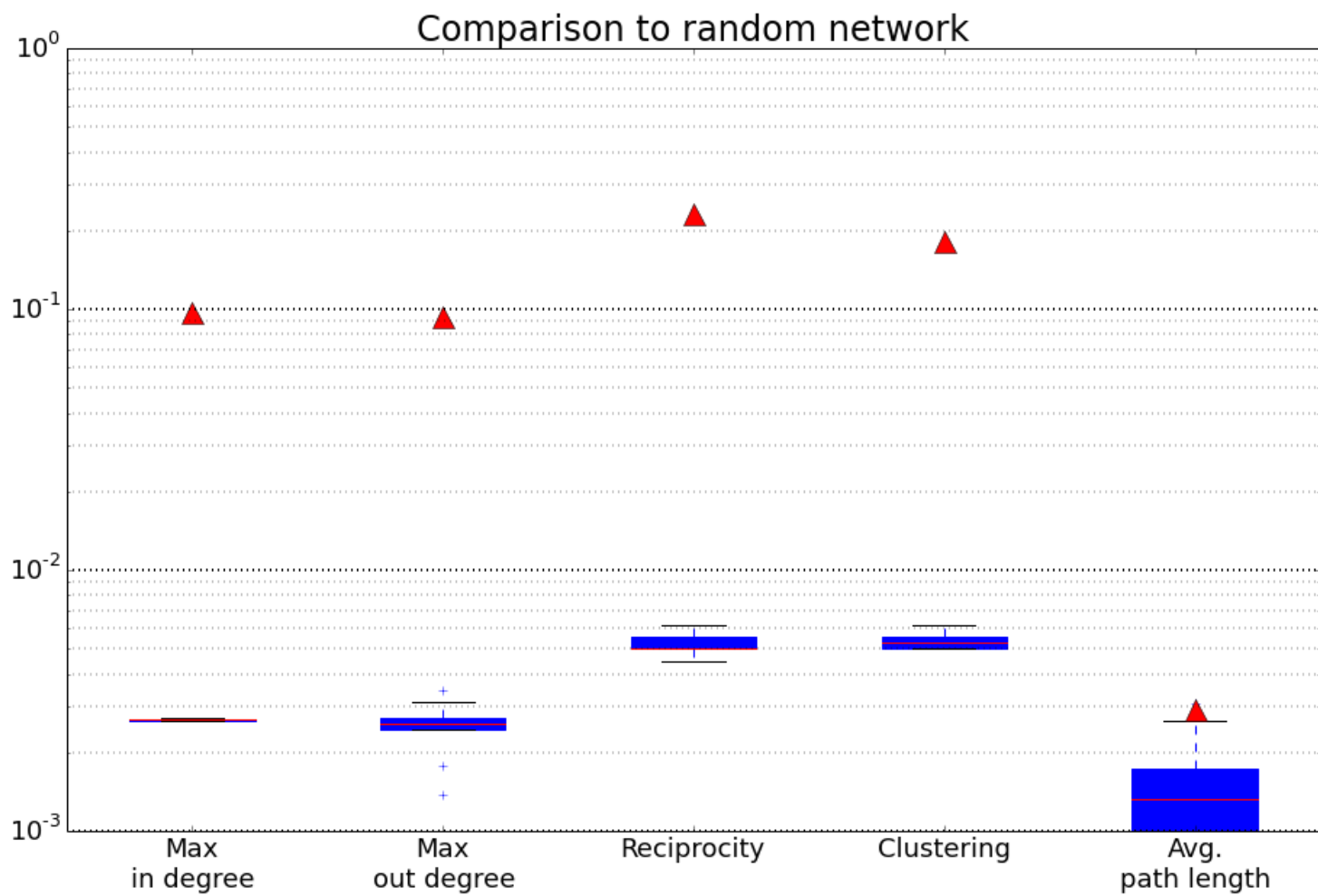
RQ1: Do accumulations of contributions within socio-technical artifacts have complex structures? (***Structure***)

RQ2: What do these accumulations reveal about the dynamics of socio-technical collaborations? (***Dynamics***)

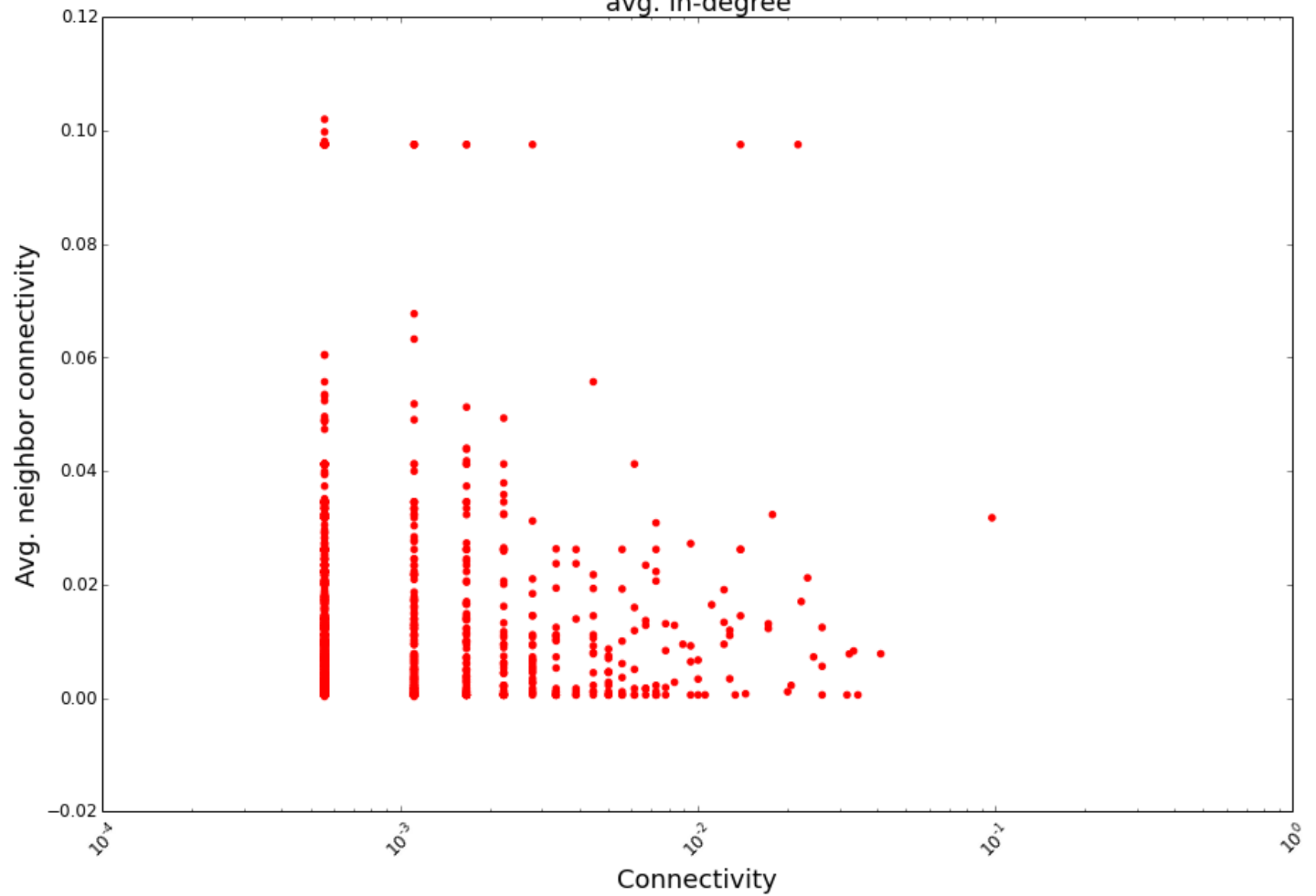
RQ3: How does this method generalize to other systems, accumulated user activity, etc.? (***Generalizability***)



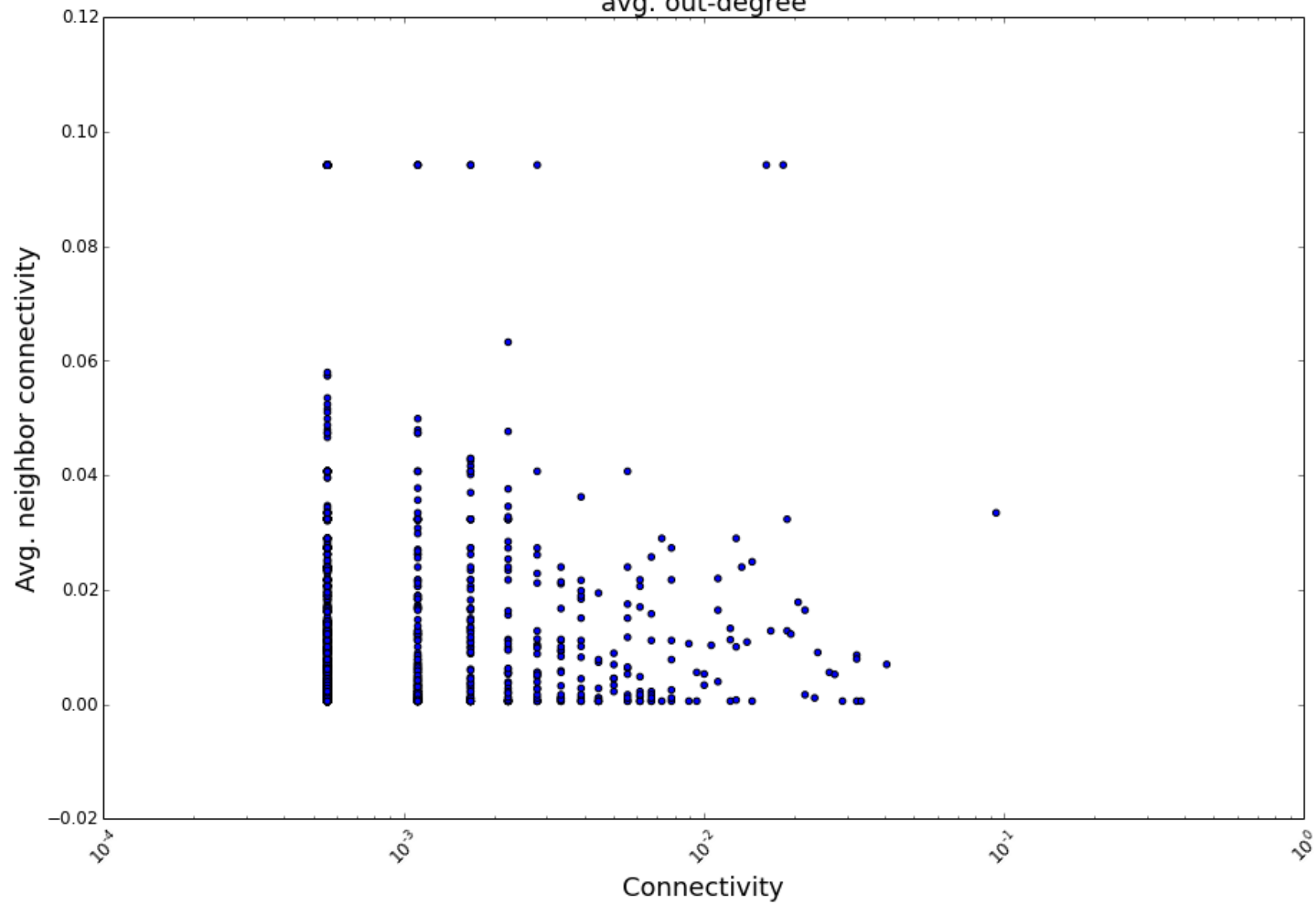




In-degree neighbors
avg. in-degree



Out-degree neighbors
avg. out-degree



RQ1: Do accumulations of contributions within socio-technical artifacts have complex structures? (***Structure***)

- Centralization, reciprocity, and clustering of trajectory is significantly higher than random graphs of similar size & density
- Negative degree correlations → well-connected editors modifying poorly-connected editors' contributions

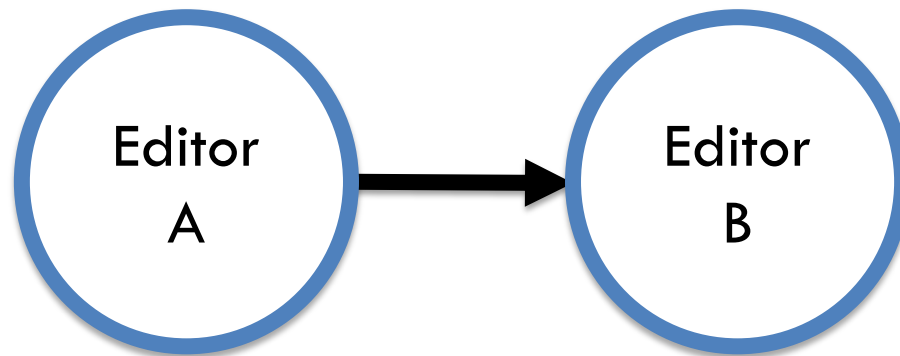
RQ1: Do accumulations of contributions within socio-technical artifacts have complex structures? (***Structure***)

RQ2: What do these accumulations reveal about the dynamics of socio-technical collaborations? (***Dynamics***)

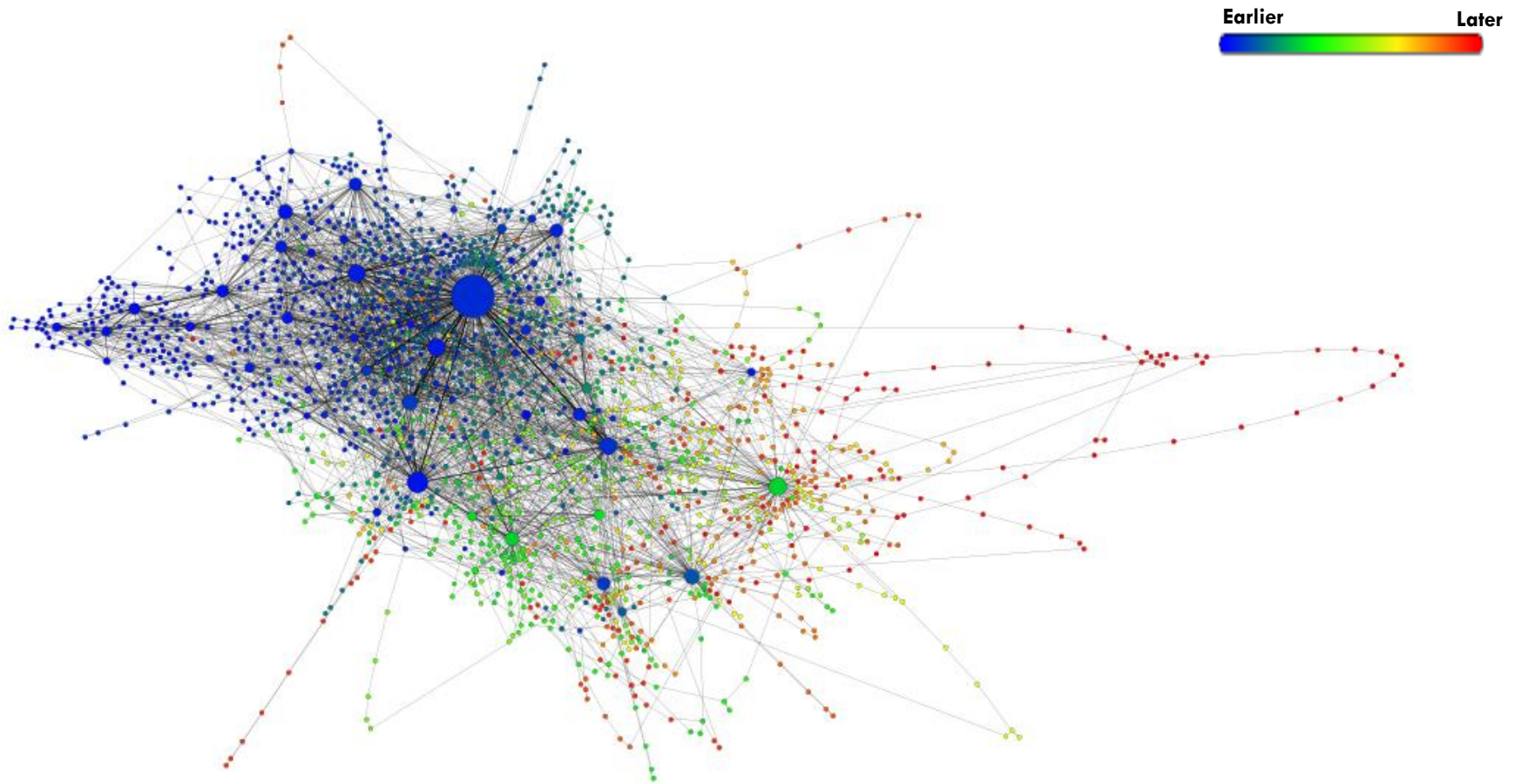
RQ3: How does this method generalize to other systems, accumulated user activity, etc.? (***Generalizability***)

Rich attributes

- **Edit latency:** time elapsed between changes
- **Edit size:** amount of content added/removed
- **Edit content:** features of content added/removed



Color nodes by start time



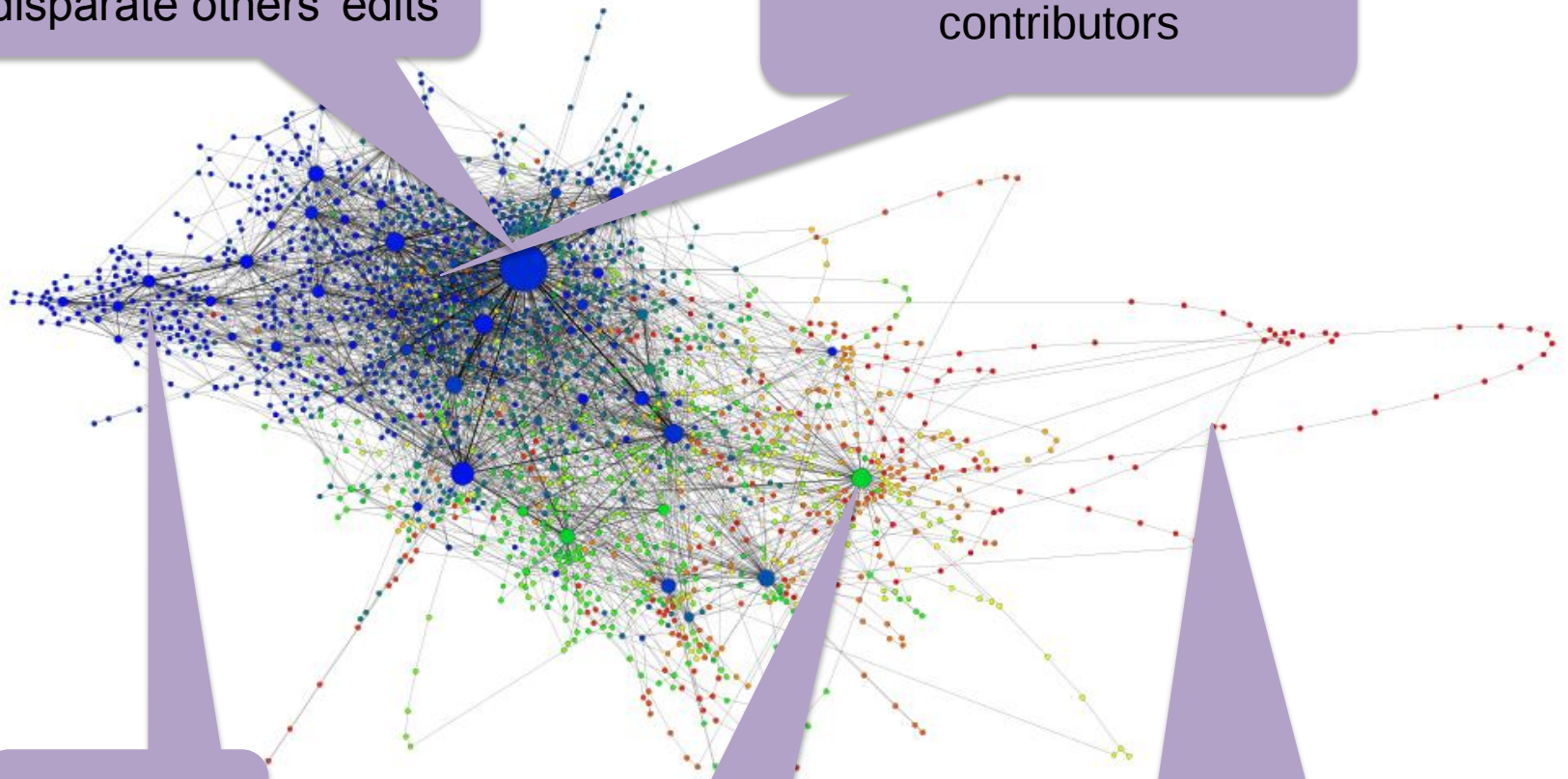
Steward integrating
disparate others' edits

Core of involved
contributors

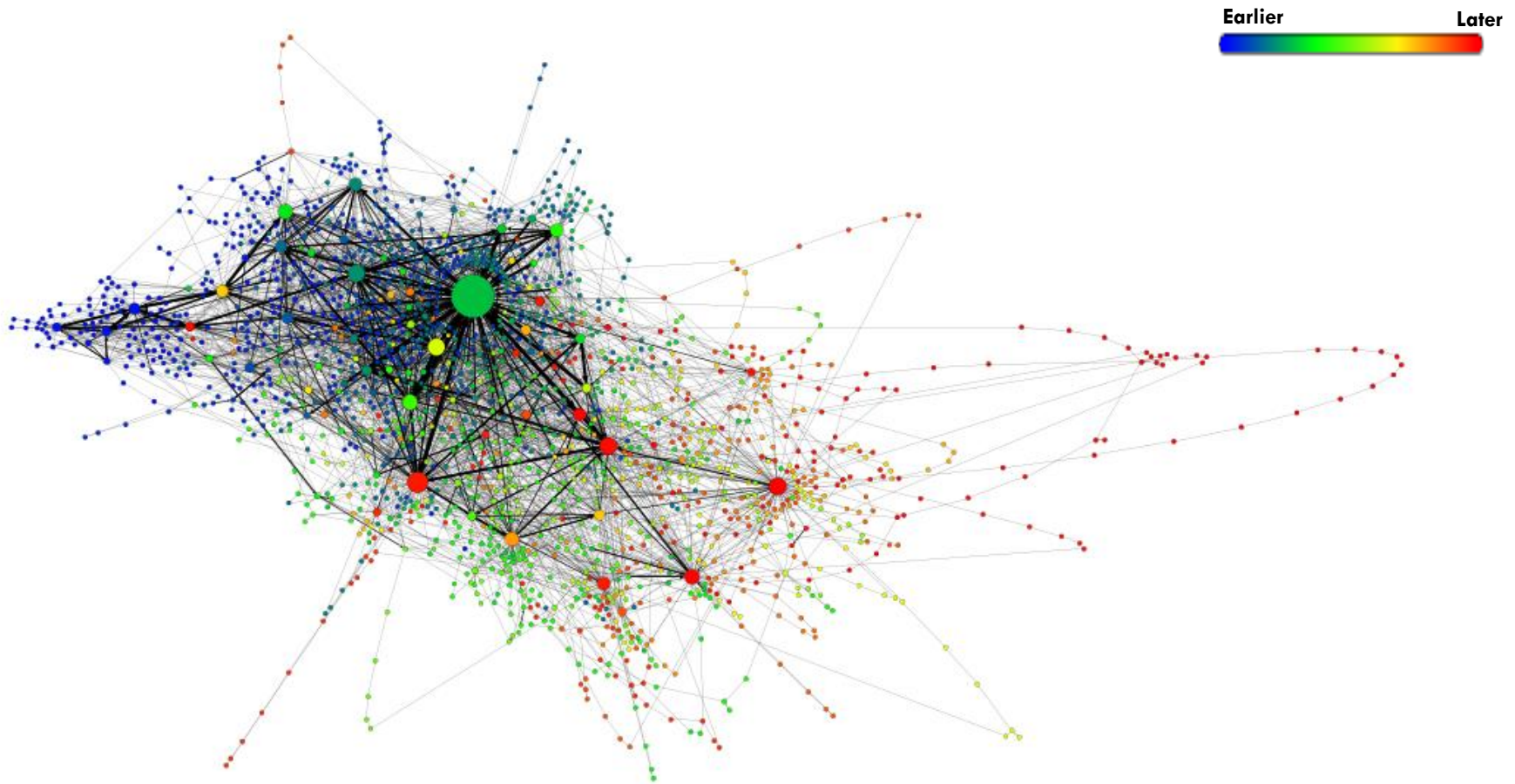
First
editors

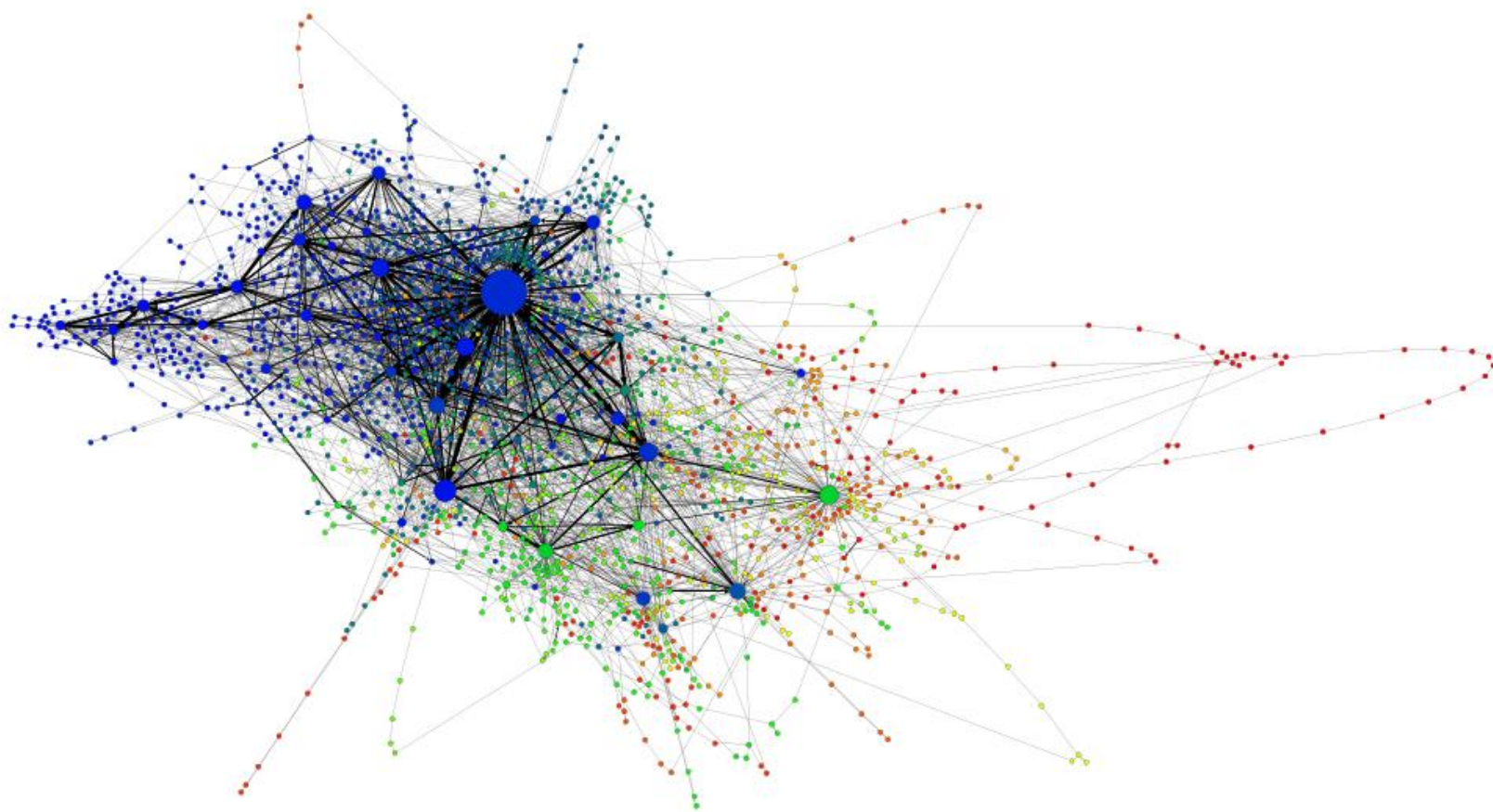
Vandal fighter

Periphery of ephemeral
editors

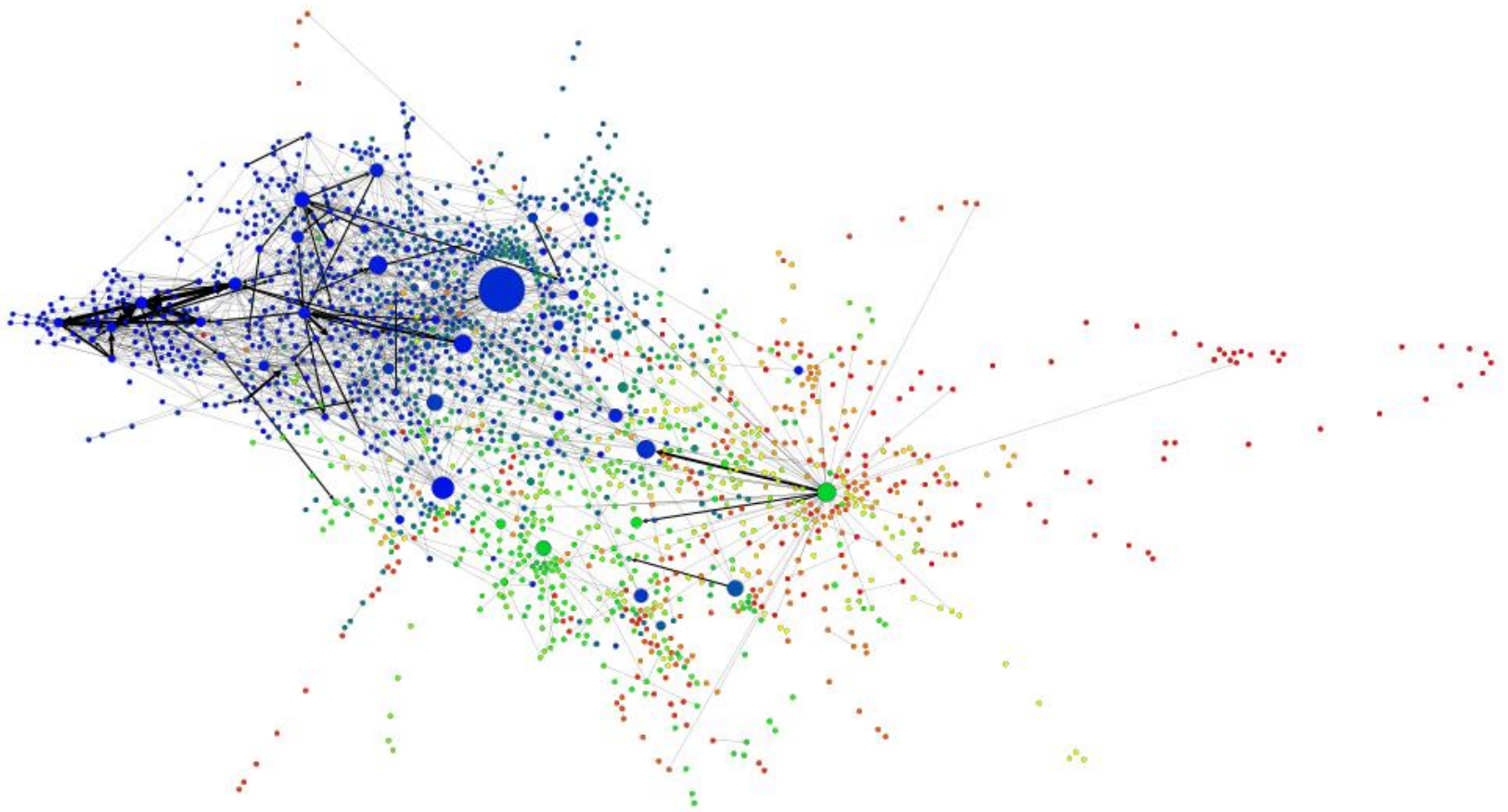


Color nodes by stop time

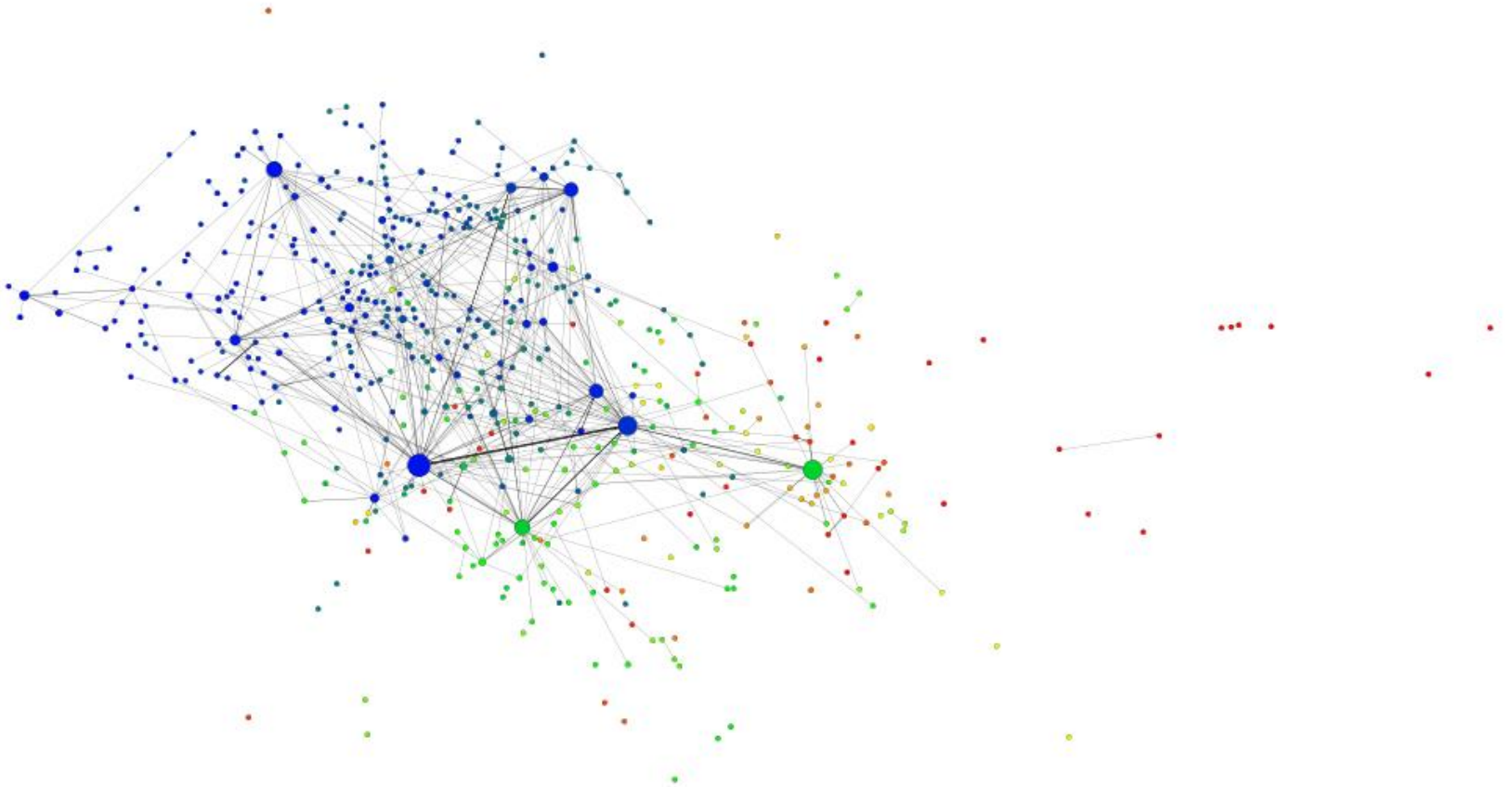


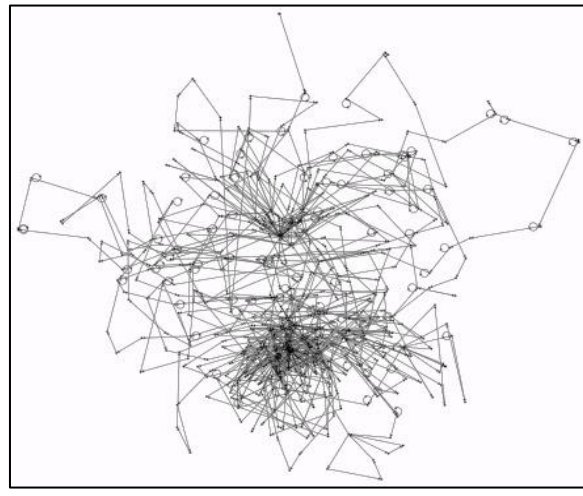
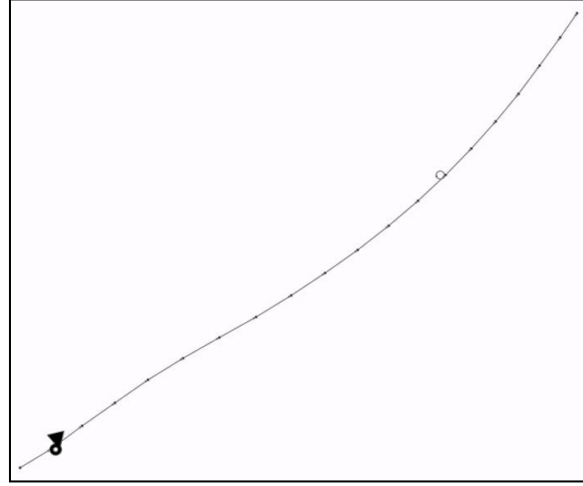
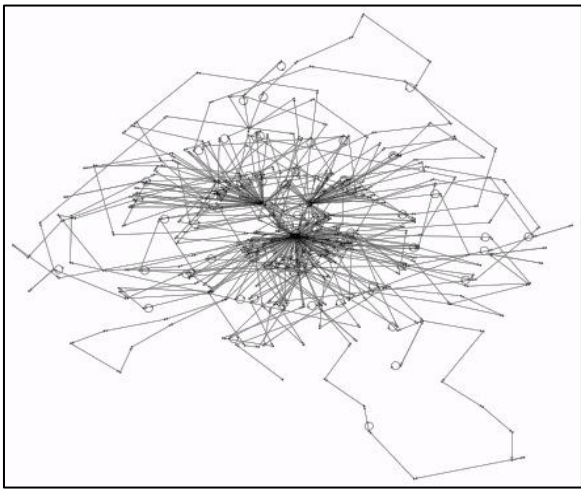
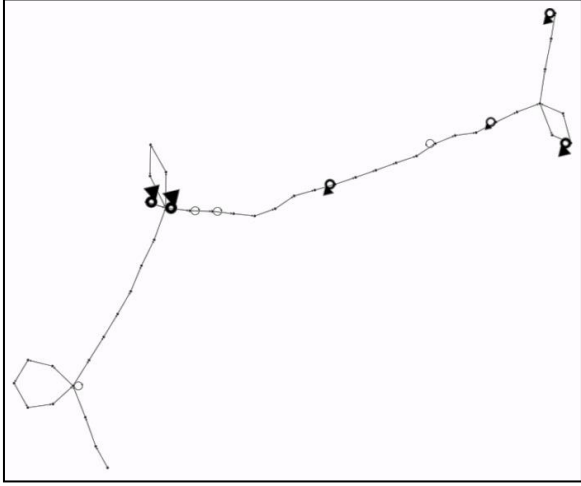


Links <60 seconds old

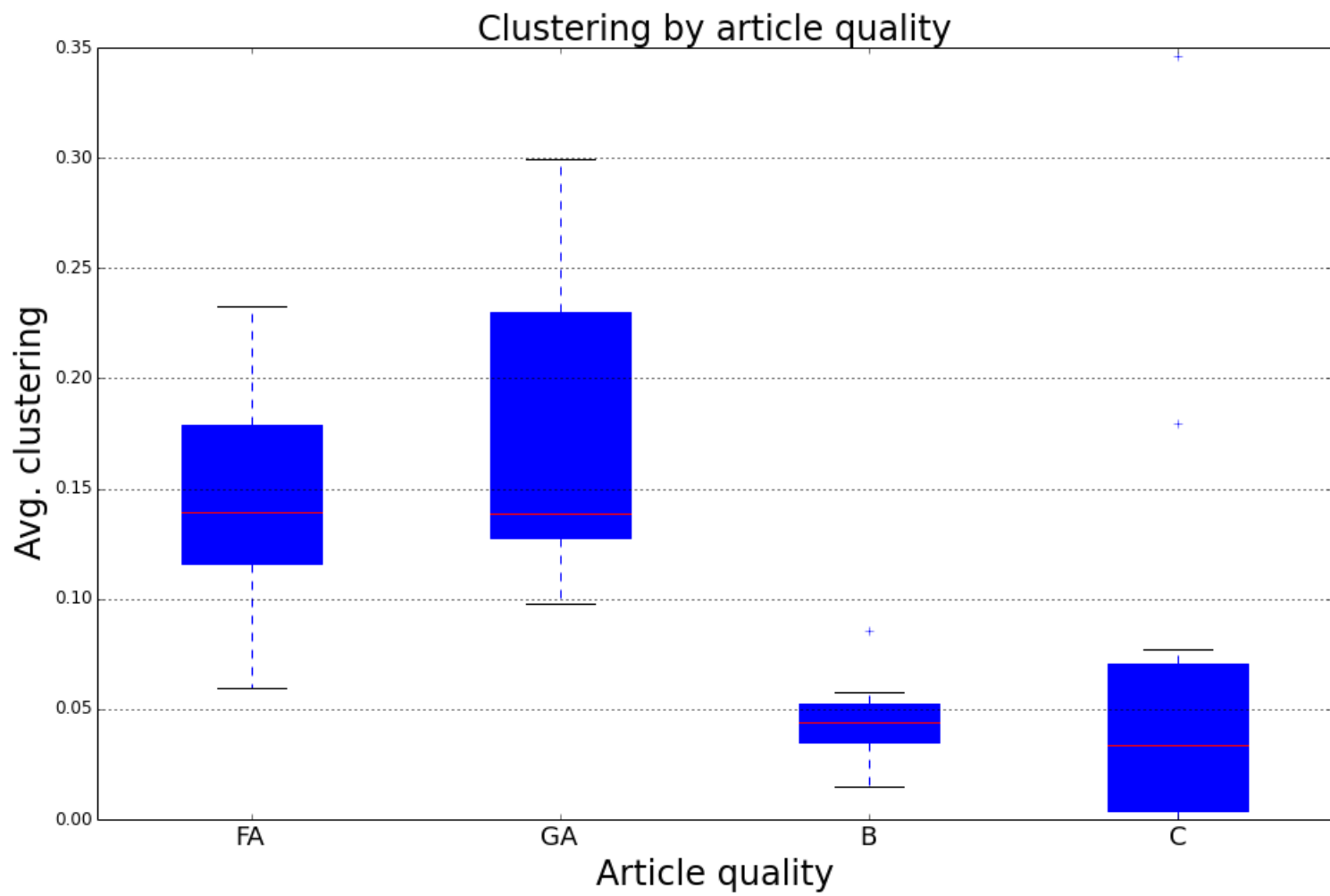


Nodes adding >50 bytes

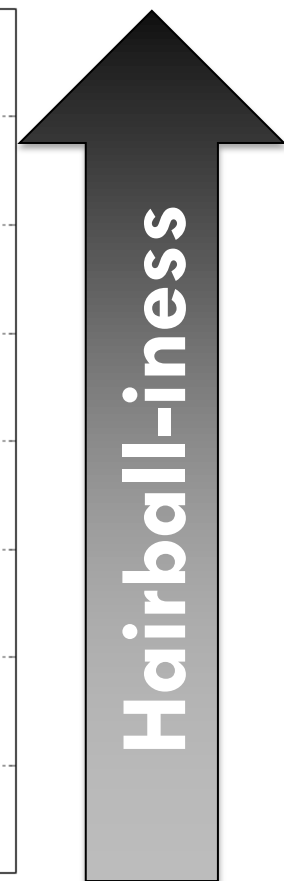
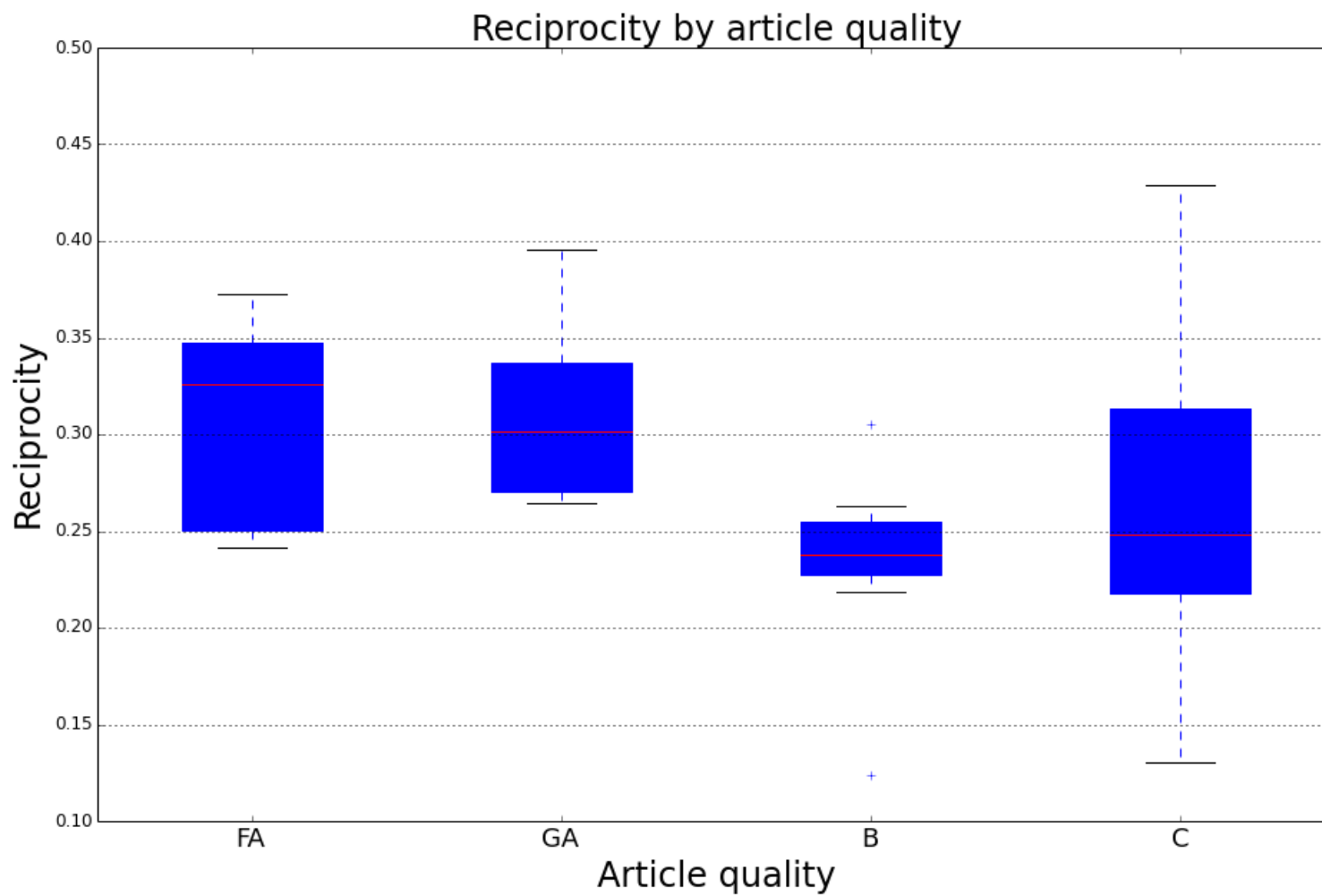


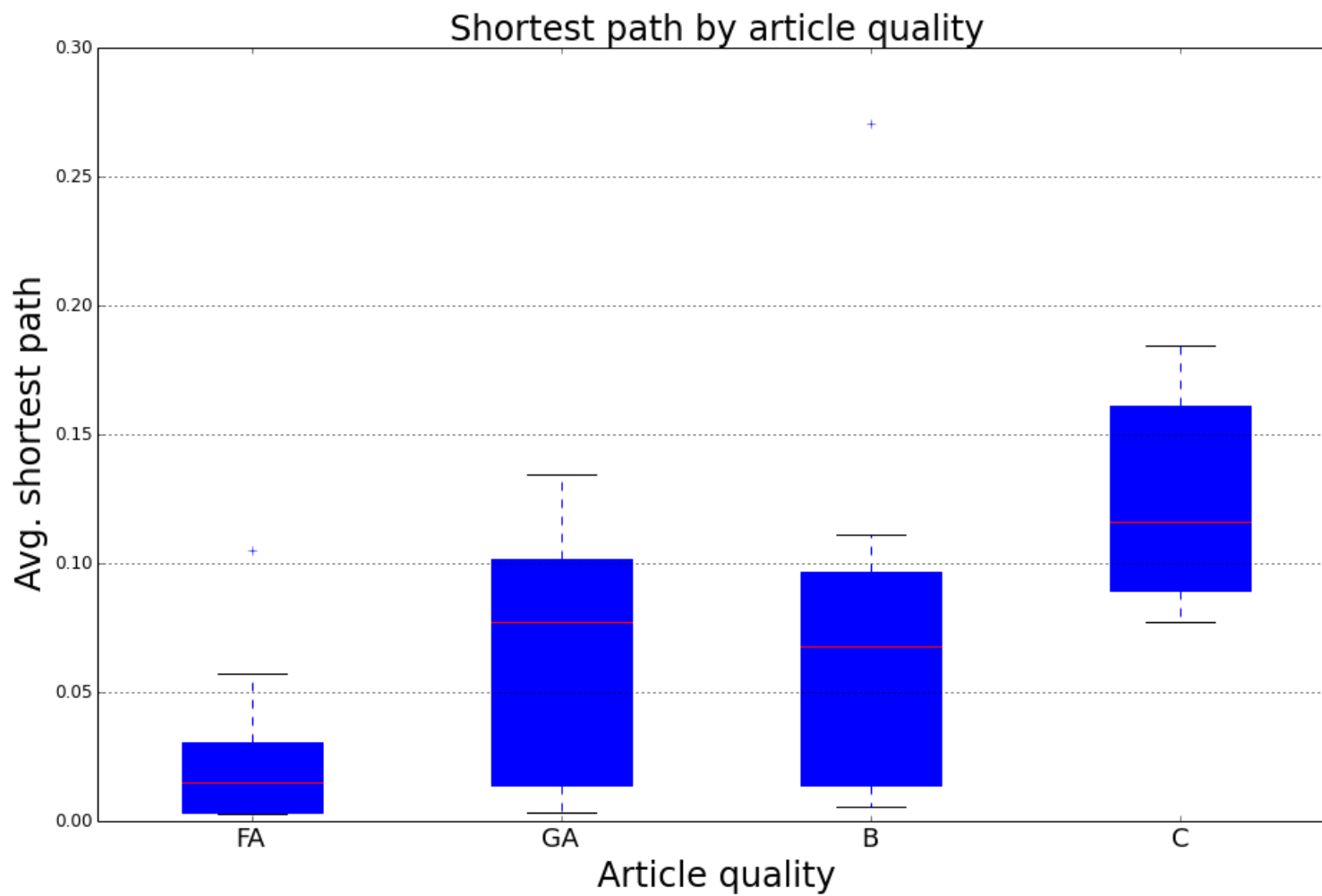


Hairball-iness



Hairball-iness





Hairball-iness

RQ2: What do these accumulations reveal about the dynamics of socio-technical collaborations? (*Dynamics*)

- Trajectories reveal dynamics of editor involvement
- Articles with “hairball-ier” trajectories have better quality

RQ1: Do accumulations of contributions within socio-technical artifacts have complex structures? (***Structure***)

RQ2: What do these accumulations reveal about the dynamics of socio-technical collaborations? (***Dynamics***)

RQ3: How does this method generalize to other systems, accumulated user activity, etc.? (***Generalizability***)

Merge pull request #9489 from BBosman/ol-breadcrumb

[Browse code](#)

OL breadcrumbs

🔗 3.0.0-wip



mdo authored an hour ago

commit b9620a1d5e519d1befd14f811c91b87f3c49f00b

2 parents 518c324 + c4568e4

Showing 1 changed file with 8 additions and 8 deletions.

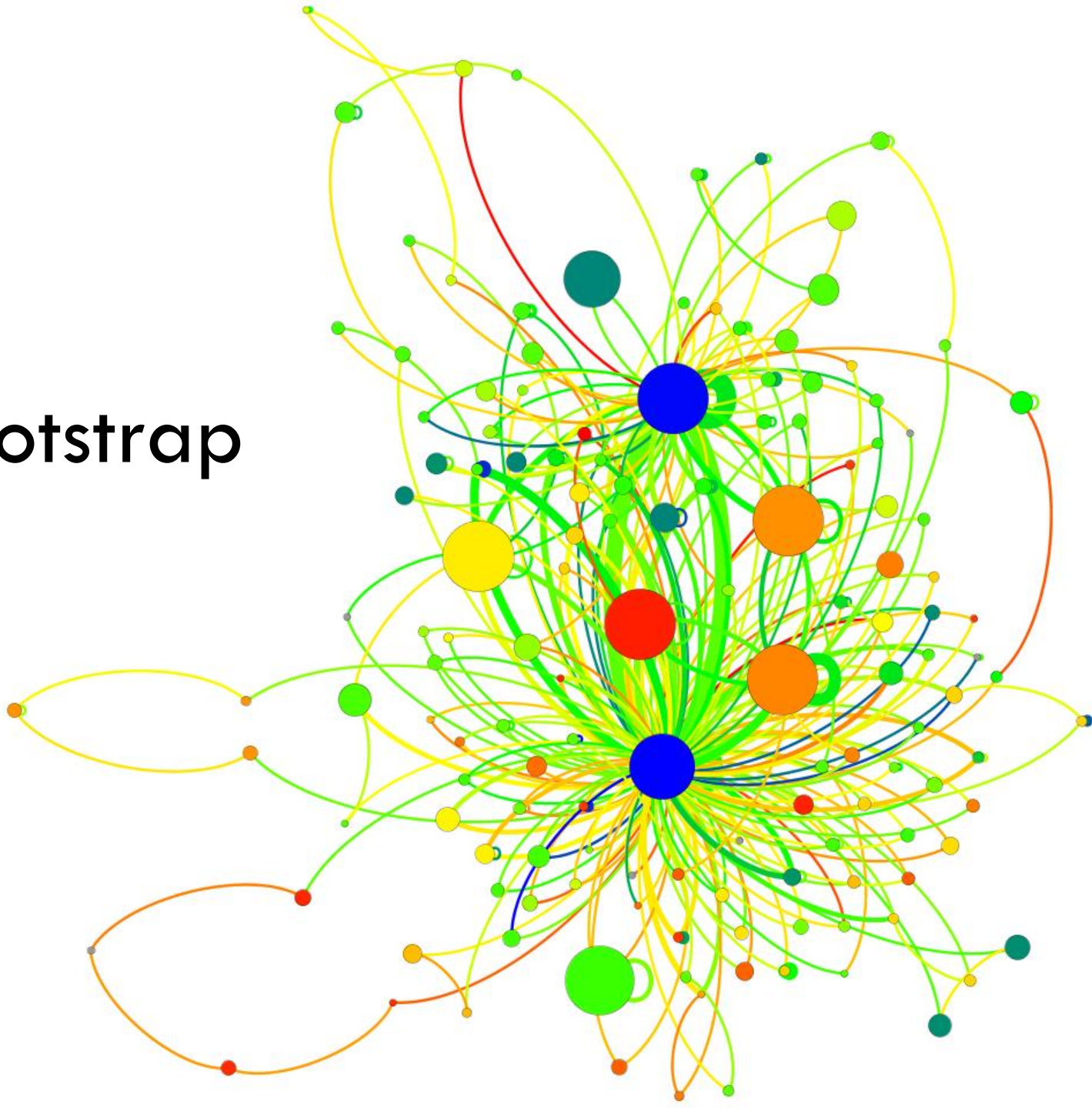
[Show Diff Stats](#)

16 components.html

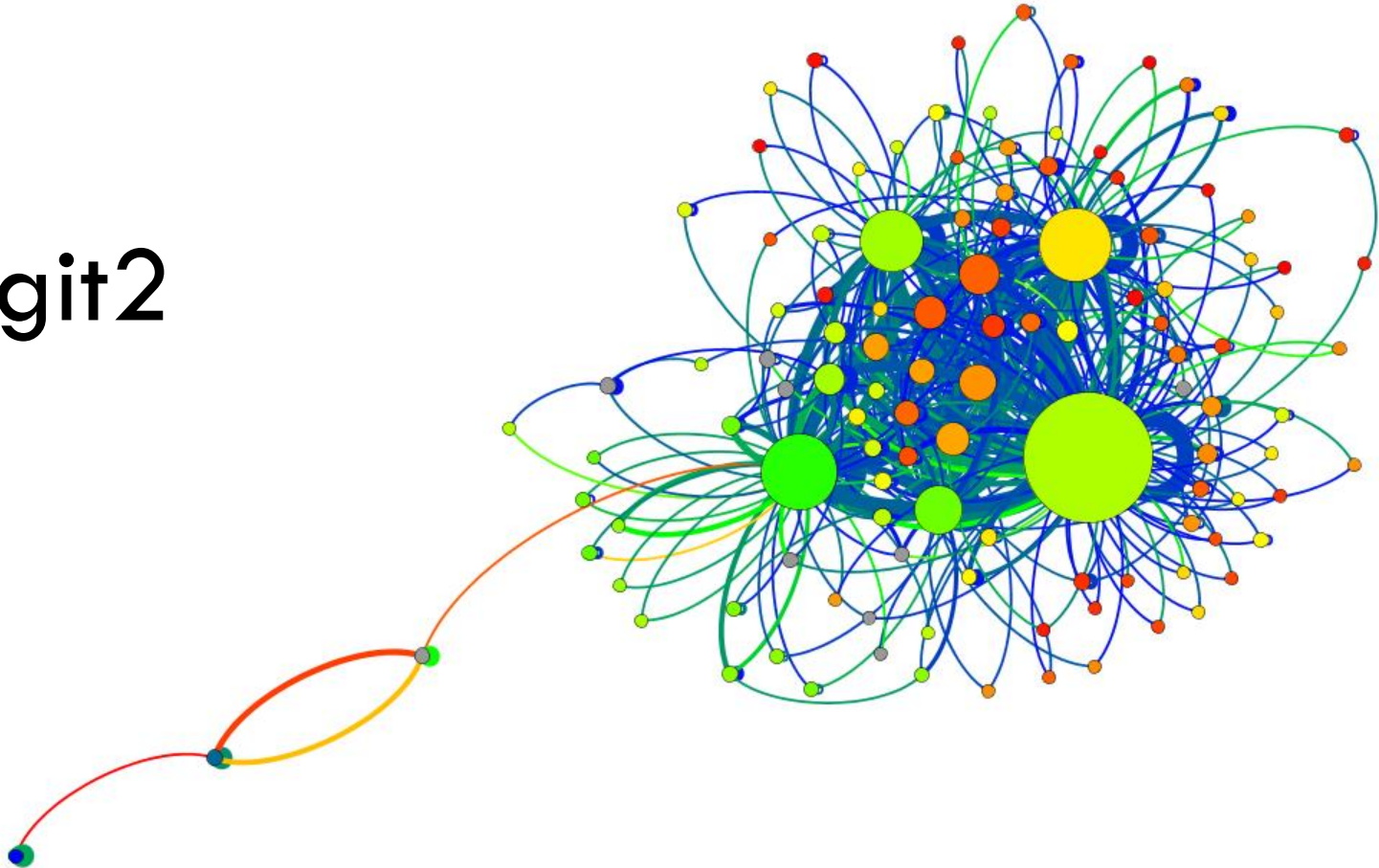
[View file @ b9620a1](#)

...	...	@@ -1445,25 +1445,25 @@	<h1 id="breadcrumbs">Breadcrumbs <small></small></h1>
1445	1445		<p class="lead">Indicate the current page's location within a navigational hierarchy.</p>
1446	1446		Separators are automatically added in CSS through <code>:before</code> and <code>content</code>.
1447	1447		<div class="bs-example">
1448		-	<ul class="breadcrumb">
	1448	+	<ol class="breadcrumb">
1449	1449		<li class="active">Home
1450		-	
1451		-	<ul class="breadcrumb">
	1450	+	
	1451	+	<ol class="breadcrumb">

bootstrap



libgit2



User contributions

For Madcoverboy (talk | block log | uploads | logs | filter log)

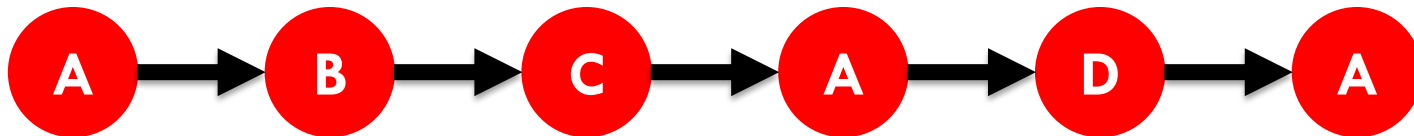
[Help:User contributions](#)

(newest | oldest) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

- 17:59, 12 August 2013 (diff | hist) . . **(+964)** . . Wikipedia talk:WikiProject Universities (*→Proliferation of prestige-boosting in leads: new section*)
- 23:13, 31 July 2013 (diff | hist) . . **(+6)** . . John T. Riedl (*→Honors and awards: en-dash*)
- 14:27, 20 July 2013 (diff | hist) . . **(+84)** . . Social network (*Unclear what a "complex set" of dyadic ties is. Emphasize methodological and theoretical contributions of social networks.*) (*Tag: VisualEditor*)
- 18:59, 19 July 2013 (diff | hist) . . **(+375)** . . John T. Riedl (*document refs*)
- 16:55, 17 July 2013 (diff | hist) . . **(+64)** . . John T. Riedl (*→Honors and awards: dab*)
- 00:54, 17 July 2013 (diff | hist) . . **(0)** . . John T. Riedl (*spelling*) (*Tag: VisualEditor*)
- 20:51, 16 July 2013 (diff | hist) . . **(+28)** . . John T. Riedl (*Tag: VisualEditor*)
- 20:50, 16 July 2013 (diff | hist) . . **(+768)** . . John T. Riedl (*→Highly cited articles*)
- 20:42, 16 July 2013 (diff | hist) . . **(-123)** . . John T. Riedl (*similar reference to IEEE fellow*)
- 20:34, 16 July 2013 (diff | hist) . . **(-110)** . . John T. Riedl (*fixing copyvio from his UMN PR*) (*Tag: VisualEditor*)
- 20:28, 16 July 2013 (diff | hist) . . **(0)** . . John T. Riedl (*fixing ref*)
- 20:28, 16 July 2013 (diff | hist) . . **(-29)** . . John T. Riedl (*linking software award to ref, removing link in cite*)
- 20:24, 16 July 2013 (diff | hist) . . **(+193)** . . John T. Riedl (*moving pr up to cite*)
- 20:06, 16 July 2013 (diff | hist) . . **(+16)** . . John T. Riedl (*add ACM publisher*) (*Tag: VisualEditor*)

User's event log

Activity	Case	Performer	Order
Commit	A	X	1:01
Commit	B	X	2:02
Commit	C	X	3:03
Commit	A	X	4:04
Commit	D	X	5:05
Commit	A	X	6:06



Flodded

Mobile phones

2011 Tucson shooting

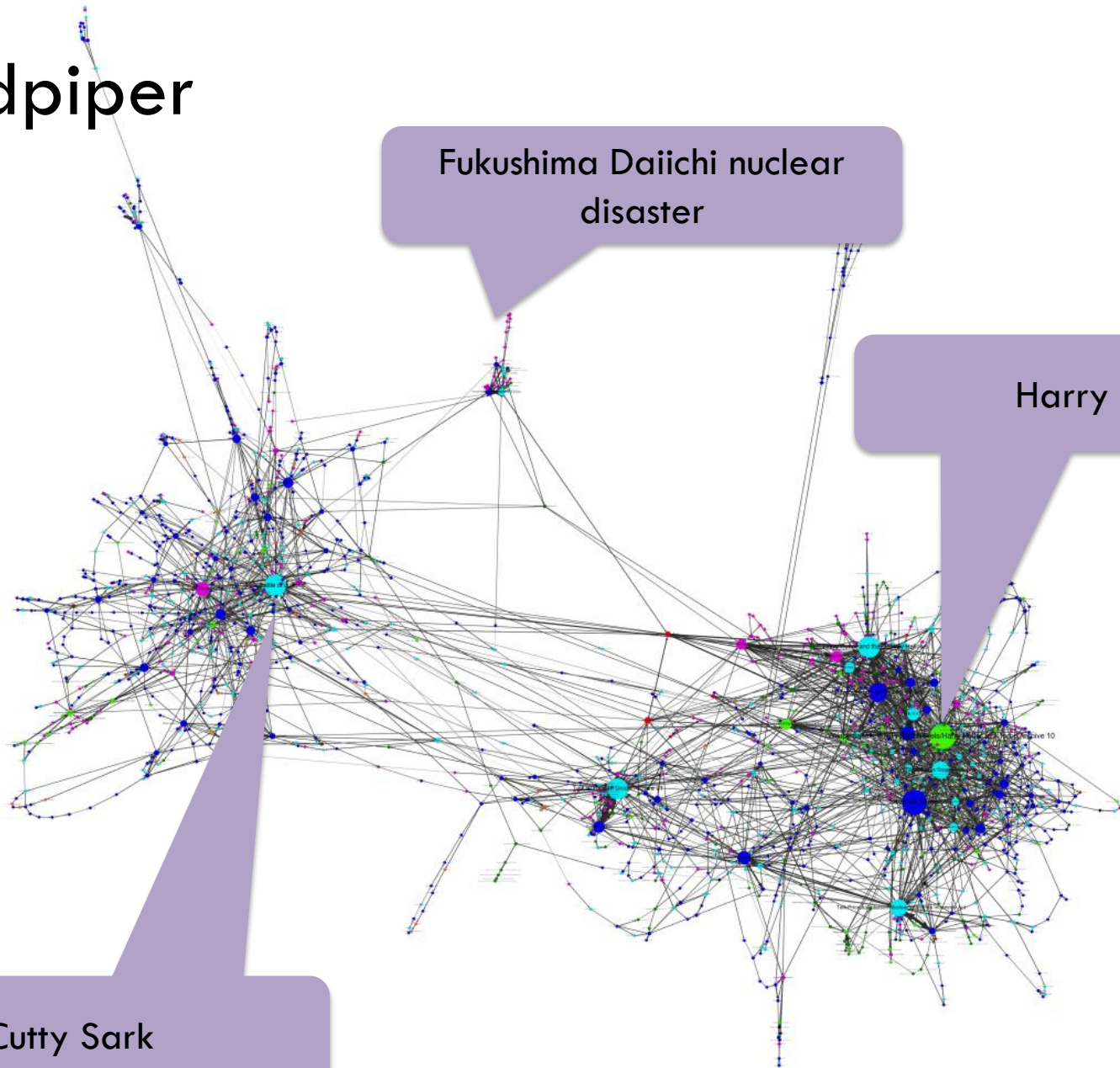
Earthquake and tsunami

Antarctica

2011 Tōhoku earthquake and tsunami

Template:2011 Tohoku earthquake and tsunami casualties/death

Sandpiper



Fukushima Daiichi nuclear
disaster

Harry Potter

Cutty Sark

ACSE

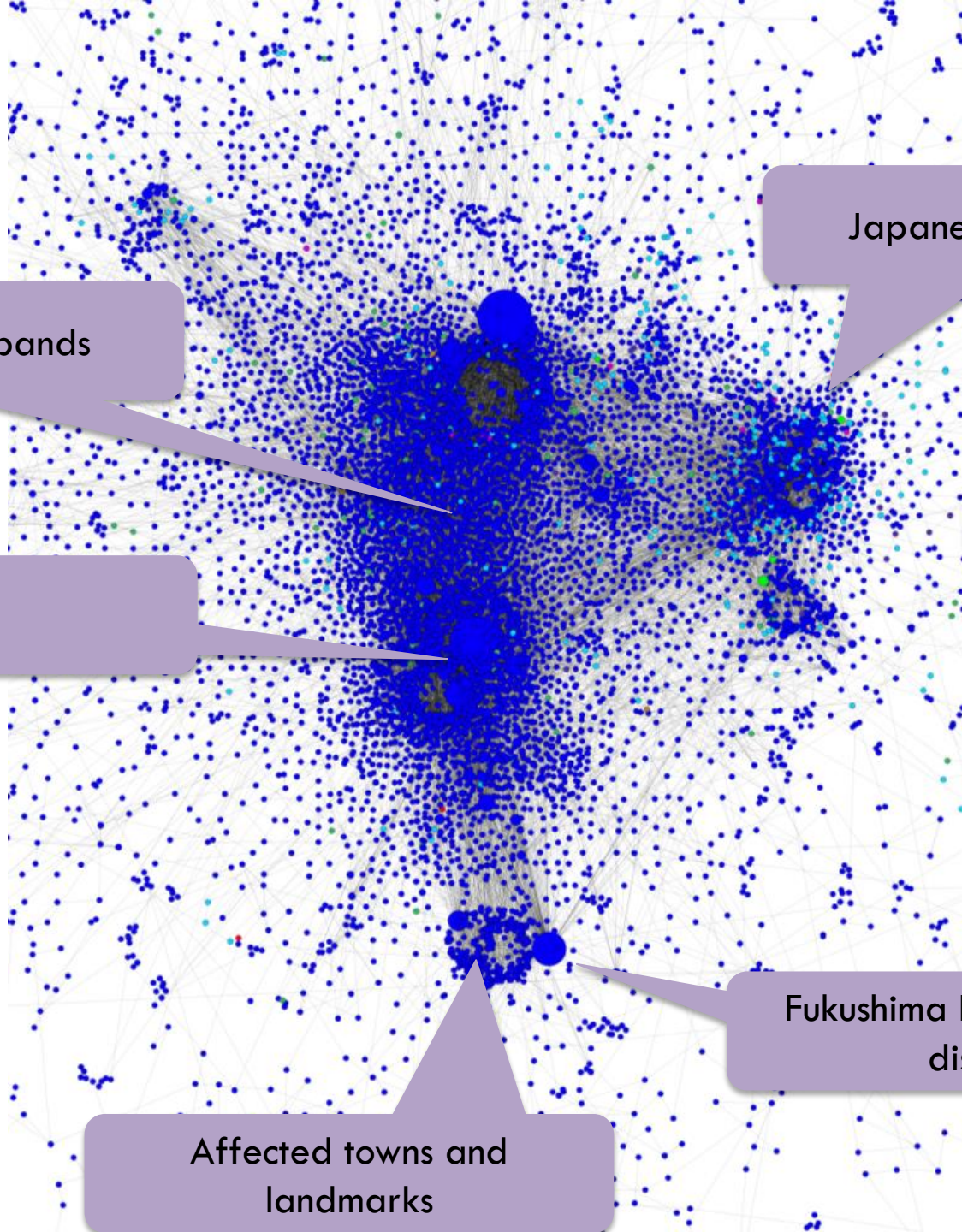
Japanese pop bands

Japanese serial killers

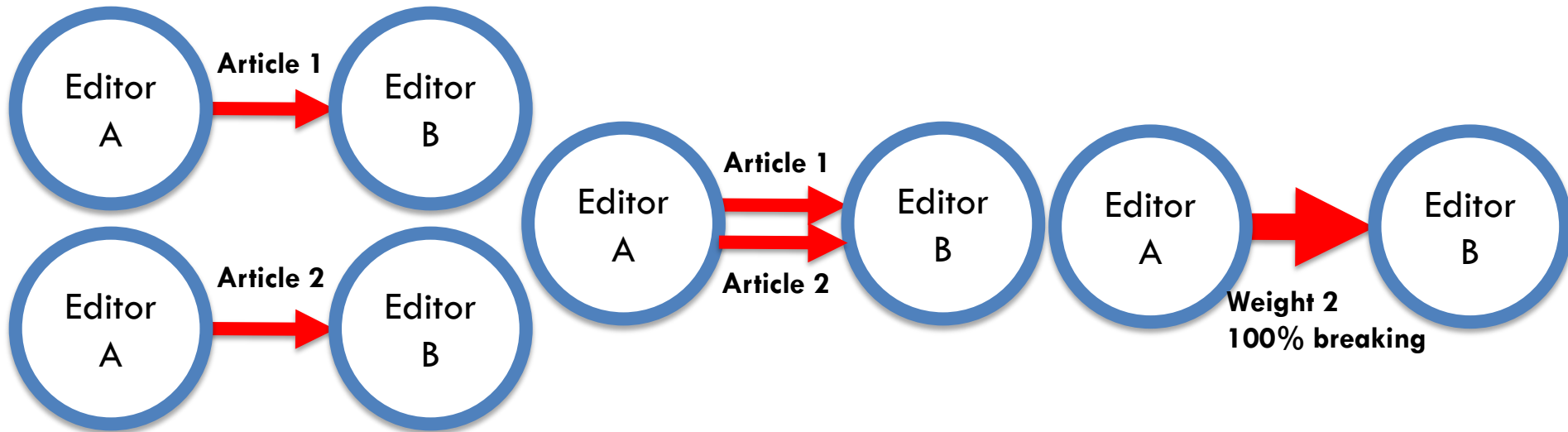
Japan

Fukushima Daiichi nuclear
disaster

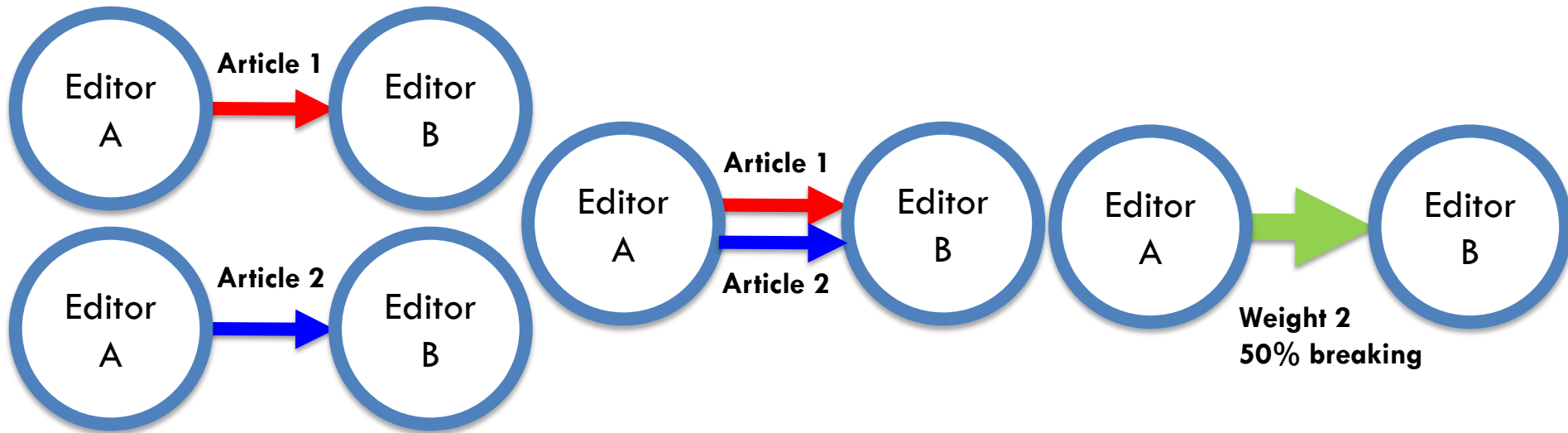
Affected towns and
landmarks

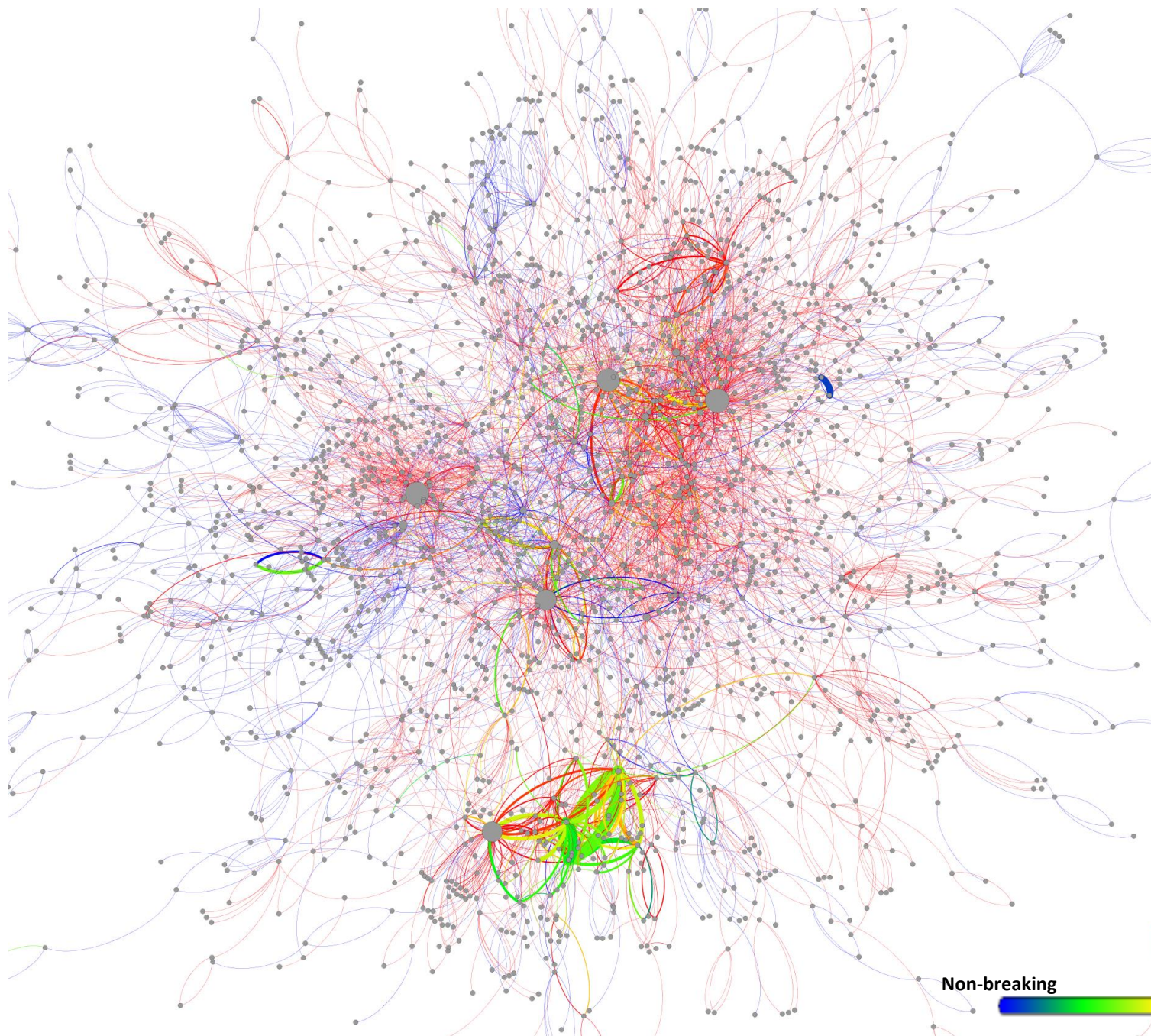


Do editors interact across articles?



Color edges by article type





Non-breaking

Breaking

Wikipedia:WikiProject Tropical cyclones

From Wikipedia, the free encyclopedia



Wikipedia Ads

file info — #84

Shortcuts:

[WP:TROP](#)

[WP:WPTC](#)

[WP:WTC](#)

Welcome to **WikiProject Tropical cyclones**, a [WikiProject](#) to systematically organize all the information in Wikipedia related to **tropical cyclones** (also known as **hurricanes** or **typhoons**). This project's focus is to centralize the efforts of many [Wikipedians](#) to make Wikipedia the best free resource when it comes to information about the subject.

If you want to help, feel free to look at the project's [noticeboard](#), the [to do list](#), the [#wiki-hurricanes](#) IRC channel, or this [talk page](#).

Scope

[\[edit\]](#)

This [WikiProject](#) aims to provide a common layout for articles on official tropical cyclones—classified by any warning center, or considered a tropical cyclone in a scientific journal or publication—as well as the science behind them.

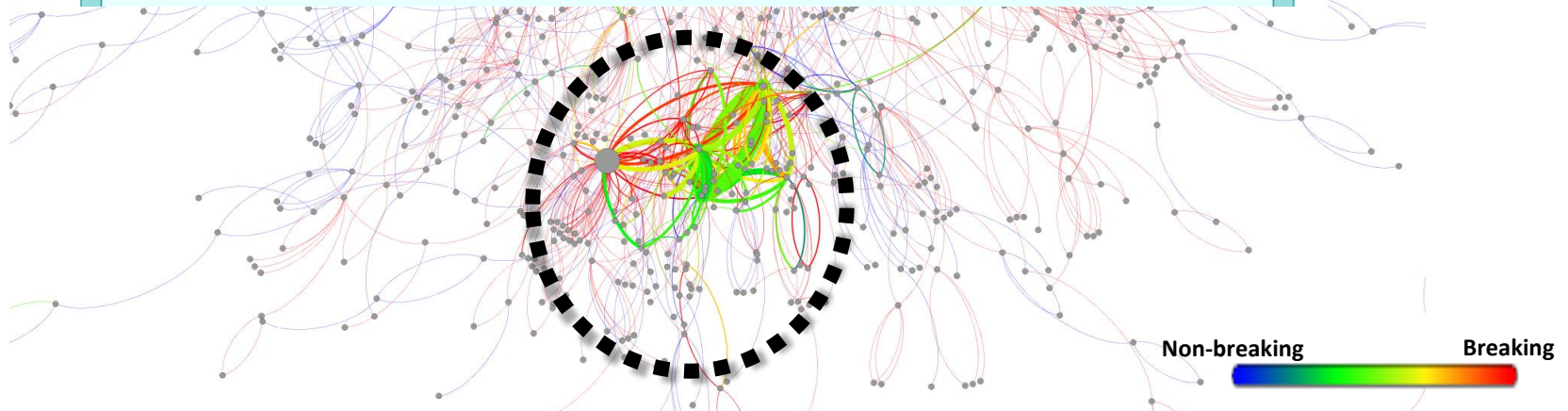
Goals

[\[edit\]](#)

To provide an encyclopedic overview for tropical cyclones, including coverage of historical individual storms and the structure of a cyclone, and to categorize all known tropical cyclones in an effective and cohesive fashion.

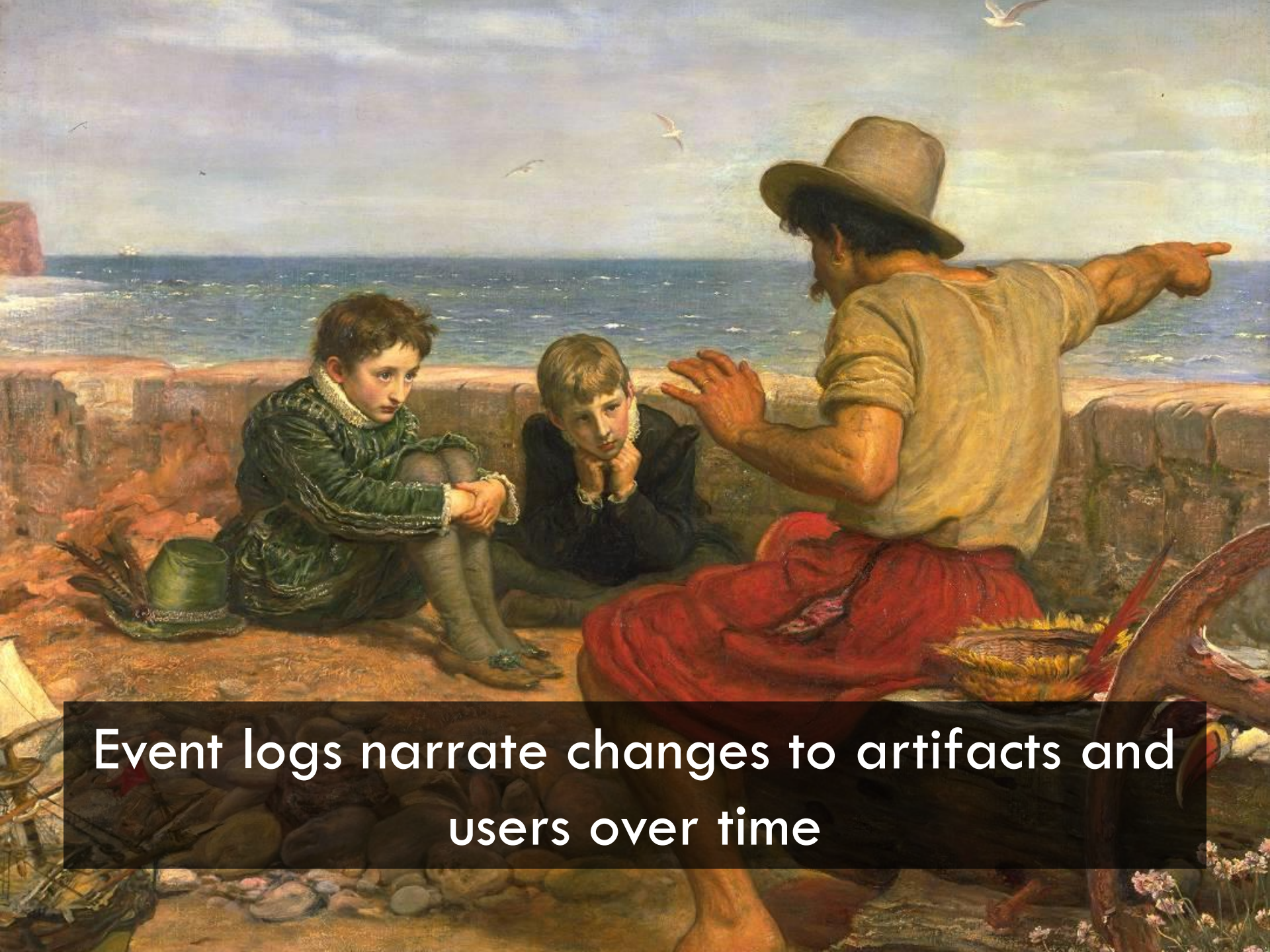


Hurricane Felix as viewed from the [International Space Station \(ISS\)](#) on September 3, 2007.



RQ3: How does this method generalize to other systems, accumulated user activity, etc.? (*Generalizability*)

- Trajectories can be applied to other socio-technical systems' event logs
- Trajectories reveal structures in editors' contributions documenting their shifting interests, expertise, and social roles
- Trajectories can be overlapped into multi-graphs to reveal latent communities of practice



Event logs narrate changes to artifacts and users over time

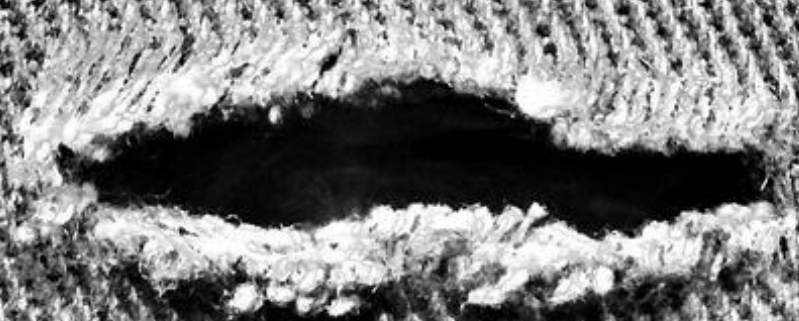
Temporal adjacencies in event logs collapse
large-scale data into networks

Last quarter 12 day, 8h. 14m. morning.											
New moon 12 day, 4h. 45m. evening.											
First quarter 18 day, 9h. 45m. evening.											
Full moon 26 day, 10h. 50m. evening.											
W. D.	☉ rises & sets	L. D.	☉ S	☉ A	F. sea.	place	● rise	● set.	H. M.	four	7*s
Tues.	7 31 58 58	4 19	2 12	belly	8 57	2 57	8 4				
Wedn.	7 31 58 58	4 20	2 55	belly	9 54	3 40	8				
Thurs.	7 30 59	5 21	3 38	belly	10 52	4 23	8				
Friday	7 30 59	5 22	4 21	reins	11 52	5 6	8				
Satur.	7 29 59	6 23	5 6	reins	morn.	5 51					
SUN.	7 28 59	6 24	5 52	secrets	0 54	6 37					
Mond.	7 28 59	7 25	6 40	secrets	1 57	7 25					
	7 28 59	7 26	7 32	secrets	3 3	8 1					
	7 28 59	7 27	8 28	thighs	4 8	9 1					
	7 28 59	8 28	8 28	thighs	5 13	10					

Complexities in accumulated contributions
suggests need for stigmergic theories



Trajectories expose regularities and anomalies for qualitative analysis





Quantify implicit coordination, social role adoption, and communities of practice

Thank you!

www.brianckeegan.com

[@bkeegan](https://twitter.com/bkeegan)

github.com/brianckeegan

Slide 2: <http://www.anicursor.com/FlyoverCologne.jpg>

Slide 3: [https://commons.wikimedia.org/wiki/File:Yeni Cami mosque and Emin%C3%B6n%C3%BC bazaar.jpg](https://commons.wikimedia.org/wiki/File:Yeni_Cami_mosque_and_Emin%C3%B6n%C3%BC_bazaar.jpg)

Slide 4: <http://www.oberlin.edu/images/Art336/366-187.JPG>

Slide 5: <http://www.oberlin.edu/images/Art336/366-192.JPG>

Slide 6: [https://commons.wikimedia.org/wiki/File:Pieter Bruegel d. %C3%84. 074.jpg](https://commons.wikimedia.org/wiki/File:Pieter_Bruegel_d._%C3%84.074.jpg)

Slide 7: [https://commons.wikimedia.org/wiki/File:Demolition of the tower of Lund Cathedral.jpg](https://commons.wikimedia.org/wiki/File:Demolition_of_the_tower_of_Lund_Cathedral.jpg)

Slide 8: [https://commons.wikimedia.org/wiki/File:Cathedral Termite Mound - brewbooks.jpg](https://commons.wikimedia.org/wiki/File:Cathedral_Termite_Mound_-_brewbooks.jpg)

Slide 9: <http://www.callnorthwest.com/wp-content/uploads/2012/10/cockroach-costume.jpg>

Slide 62: <http://www.tate.org.uk/art/artworks/millais-the-boyhood-of-raleigh-n01691>

Slide 63:

Slide 64: <http://www.flickr.com/photos/bxgd/3832435376/>

Slide 65: [http://www.flickr.com/photos/a whistling train/6540309155/](http://www.flickr.com/photos/a_whistling_train/6540309155/)

Slide 66: <http://www.flickr.com/photos/seamaster75/8451763013/>