Reconfigure from all over:
the case of interdisciplinary open-source communities

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Spontaneous Interdisciplinarity

How do we bring members of different disciplines together in open source communities to solve common problems?

C.P. Snow’s “Two Cultures”

Spontaneous Interdisciplinarity

The rise and fall of interdisciplinary research: The case of open source innovation

Christina Raasch, Viktor Lee, Sebastian Spaeth, Cornelius Herstatt

● high-involvement exchange declines quickly, and collaborations tend to decompose into parallel (and disconnected) groups.

The way research problems (and communities) are organized, particularly modularizing research processes, is key to mitigating these trends.
Community networks disconnect and reconnect over time. Seasonal and random fluctuations in people onboarding and leaving.
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Community networks tend to be heterogeneous. Whether they also form self-contained cliques is up to the community.
What is the structure of networks for open-source collaboration?

- open-source communities are transient, flexible, and heterarchical.

**Heterarchy**: nodes can be ranked in a number of different ways.

- aside from project leader initiatives, numerous ways to become connected into and gain connectivity in network.

- low barrier to entry in the network means that preferential attachment rule is not generally applicable.

- open-source networks have multiple functions and objectives.
COURTESY: Heterarchical Systems vs Hierarchical Systems, Humanity +
https://hplusmagazine.com/2014/03/20/heterarchical-systems-vs-hierarchical-systems/
How do we redraw network structure over time (based on identity) to find optimal expertise reconfigurations?
Reconfigurability of Expertise = flexibility in membership between different modules of the network over time.
Selective Disconnection with Intentional Interconnectivity

Alternative to Network Statistics: Soft (Fuzzy) Classification for Clique Membership per unit time.
Selective Disconnection with Intentional Interconnectivity

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Alternative to Network Statistics: Soft (Fuzzy) Classification for Clique Membership per unit time.

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Reconfigurability of Complex Academic Institutions

How can we leverage community expertise from a wide range of campus units or topical interest areas?
What does a Digital (Open-source) Campus Look Like?

- Building
- Scheduling, Access
- Data Security
- Transportation
- Campus Events
- Social Interactions
- Virtual Worlds, Streaming Media
- Weather, Campus Physical State
- Libraries
- Wellness
- Academic Connective Tissue
Zooming in on Academic Interests: an Alt-Ac Community Example

Orthogonal Research and Education Laboratory

Topical Connectivity

- Deep Learning
- Computational Biology
- Developmental Science
- Genetic Programming
- Virtuality
- Network Science
- Neuro/AI
- Ethics/Tech/Society
- Cybernetic Regulatory Networks
Which contributors and disciplines are your greatest sources of contributor activity?
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Input of contributor from Discipline A

- What kind of niche expertise do they bring into the community?
- do they act as a conduit (bring more contributors from Discipline A)?
- duration of contribution, intensity of contribution: what is the magnitude of their contribution history?
Reconfigurability of Disciplinarity

How can we leverage community expertise for a multi-stage, year-long, community-driven project?
Reconfigurability of Disciplinarity

Optimists and Pessimists

Biological Lab Expertise (January to April)
Reconfigurability of Disciplinarity

Optimists and Pessimists

Statistical Modeling
(April to July)
Reconfigurability of Disciplinariness

Optimists and Pessimists

Philosophy of Science
(July to September)
Reconfigurability of Disciplinarity

Optimists and Pessimists

Software Engineering
(September to December)
Thanks for your attention!

Join our communities!

Rokwire Community:

https://launchpass.com/rokwirecommunity

OpenWorm Foundation:

https://launchpass.com/openworm

Orthogonal Lab:

https://launchpass.com/orthogonal-research