Innovation Policy Challenges in a Networked World

- **User, open, and collaborative innovation is in tension with the standard IP paradigm**
  - **User innovation is prevalent in developing countries, especially based on network technology**
    - **E.g. Mobile phone/financial service innovation, small businesses**
  - **These paradigms usually rely on low or no formal IP**
    - **Challenge assumption that more protection is socially beneficial or even beneficial to US interests**
- **Data-driven innovation, privacy and discriminatory impact**

IP: Costs and Benefits

- **Benefits:**
  - motivate invention by deterring “free riding”
  - motivate disclosure rather than secrecy
  - motivate dissemination through sales and licensing
- **Costs:**
  - higher prices (deadweight losses)
  - downstream innovation “taxed” or precluded
  - transaction costs of bargaining, licensing, defining IP boundaries, litigation, etc.
- **Underlying Assumptions:**
  - Innovators must be compensated monetarily via sales
  - Innovators are completely competitive
  - Transaction costs are not too high
  - Market demand induces the “right” innovations

User, Open, and Collaborative Innovation: Where IP's Assumptions Break Down

- **Innovators may have non-monetary incentives including**
  - **Enjoyment of creative process, sociality, altruism**
- **Alternatives to sales-based compensation including**
  - **Use, reputation, complementary business models**
- **Innovators may have common interests in**
  - **Non-monetary benefits, infrastructure, advancing or establishing a field or market**
- **IP transaction costs may be high due to**
  - **Notice problems, overlapping claims, cumulativeness, no valuation metric, one-size-fits-all legal standards**
- **Market demand may not induce the "right" innovations**
  - **Consumption externalities, inability to pay, myopia**

User, Open, and Collaborative Innovation: Where IP's Assumptions Break Down

	Biological Research Consortium	OSS	Blast Furnaces and Steel mills (1800s)	French chefs	Doctors (medical procedures)
Non-monetary incentives	Health, Curiosity	Use		Artistic fulfillment	Use, Patient health
Alternative Compensation mechanism	Reputation, public funding	Complementary business model		Reputation	Complementary business model, reputation
Common interests	Scientific knowledge	Cheap infrastructure	Compete with old technology	Tailored norms	Patient health
Demand failure	Yes				Sometimes
Transaction costs	Cumulative	Cumulative	Hard to detect		Cumulative, hard to detect

OC Innovation Is Not Magic

- **Governance**
  - Norm setting and enforcement
  - Rewards (e.g. reputation)
  - Rules or norms of membership and access
- **Infrastructure to reduce costs of sharing and collaboration**
  - Databases
  - Meetings
  - Biorepositories
  - Standards for compatibility
  - Journals
- **Possible policy response?**
  - Subsidize or mandate governance and/or infrastructure

IP Can Destabilize OC Innovation

- **IP may undermine OC governance**
  - **"Insiders" may use IP to defect**
  - **"Outsiders" may free ride on openly available innovation by staking out IP claims**
    - **Issue for public-private partnerships?**
- **IP can increase transaction costs of OC regimes**
- **IP doctrine helps delineate "pre-competitive" and competitive innovation**
  - **International differences in IP doctrine may complicate global OC innovation regimes**
  - **Converging to strong IP may undermine OC regimes**
- **Possible policy responses (TRIPS?):**
  - **Infringement exemptions ("fair use")**
  - **Patentable subject matter exclusions**
  - **Remedies variation**

Data-Driven Innovation: Panacea or Hype?

- **What data?**
  - Is it representative or biased?
    - Do the biases parallel economic, racial, gender, etc. disparities?
  - Is it accurate?
    - Errors minimized and understood
  - Is it meaningful?
    - Does the data appropriately model the phenomenon of interest?
- **Whose data?**
  - Is it proprietary or available for scientific critique and validation?
  - Do human data subjects have a say in how the data is collected and/or used?

Data-Driven Innovation: Panacea or Hype?

- **What algorithm or method?**
  - **Is the algorithm open or proprietary?**
  - **What are the algorithm's assumptions?**
  - **What are the algorithm's limitations? Error bars?**
- **What are we doing with the data?**
  - **Scientific understanding? Large scale trends? Decisions about individuals?**
  - **"Prediction"?**
    - **Correlation v. Causation**
    - **Self-fulfilling prophecy and feedback issues?**
    - **Stereotyping and over-generalization?**
    - **Rapid change and tipping points?**
- **If "data is the new oil," we should watch out for smog and oil spills**

Data-Driven Innovation: Privacy and Security

- For data pertaining to individuals:
  - Who has access to the data?
    - Hackers
    - Law enforcement subpoenas
    - Malicious insiders
  - Is it “anonymized”?
    - How effectively?
  - How long is it retained?
  - Who makes decisions about its use?
    - How are use decisions made?
    - Is consent required? When is it meaningful?
  - How is the data obtained?
    - How should means of obtaining data be regulated?
    - For researchers? For commercial actors?