Data Science for the Future of Work and Opioid Epidemic

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INDIANA UNIVERSITY
SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING
Data Science

Network science

Machine Learning

Visualization

...
Automation
Millions of “Drivers”

http://atlas.media.mit.edu/en/
What will be the Future of Work?

How can we prepare our societies?
ECONOMIC GRAPH CHALLENGE
Talent Traffic 2.0
Based on original graphic and data from TopProspect. Figures show ratio of number of employees moving from one company to another (e.g. 15.5 employees left Google to work at Facebook for every employee who left Facebook for Google). The color of the cars match their source (brown cars left Microsoft).
Job history of users

User 1
C:
B:

User 2
A: 1995 - 2000
B: 2010 -

User 3
A: 2008 - 2010
B: 2010 -

Labor flow Network

A → B → C
Growth and decline of geo-industrial clusters

Acceleration

Growth

\[
\ln\left(\frac{S^{in}}{S^{out}}\right)
\]
#2 Opioid Crisis
Drug Deaths in America Are Rising Faster Than Ever

New data compiled from hundreds of health agencies reveals the extent of the drug overdose epidemic last year. Related Article

UPDATE The first governmental account of nationwide drug deaths shows roughly 64,000 people died from drug overdoses in 2016.

AKRON, Ohio — Drug overdose deaths in 2016 most likely exceeded 59,000, the largest annual jump ever recorded in the United States, according to preliminary data compiled by The New York Times.

The death count is the latest consequence of an escalating public health crisis: opioid addiction, now made more deadly by an influx of illicitly manufactured fentanyl and similar drugs. Drug overdoses are now the leading cause of death among Americans under 50.

Although the data is preliminary, the Times’s best estimate is that deaths rose 19 percent over the 52,404 recorded in 2015. And all evidence suggests the problem has continued to worsen in 2017.
What can we do to stop the Opioid Crisis?
Applying network science and machine leaning to massive prescription data to predict doctor shopping and overdose.
THANK YOU

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