Encouraging the Ecosystem: Growing Unique Partnerships through Data Science

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Data Science What is it?

- New interdisciplinary area of scholarship
- Rapidly growing demand in workplace
- Core: Math, CS, Stats, Databases & Ethics
- Also: Exercise core skills in context of domains
- Cuts across all disciplines/domains
- Overlapping with Artificial Intelligence
What is Artificial Intelligence?

- Original definition as sub-discipline of CS
  - Behaves like a human – Turing Test
- Definition as interdisciplinary domain
  - Approaches for helping machines to learn
  - Computer is not directly programmed but uses programmed algorithms to learn from data
What is Design Thinking

- Use of design processes to design:
  - Experiments – scientific/statistical/thought/...
  - Art
  - Landscape architecture
  - Software
  - Engineered products
  - Et cetera...
Why Data Science and AI in the Library?

- Topic of our discussion at an earlier CNI presentation in 2017
- AI-DS is too big to be ignored!
- Portal for Information and Training
- Agnostic location
  - Intended consequence: Scholars can find partners from other disciplines
- MakerSpace, AI, Design/Think Lab, Innovation Center
CONVERSATION. COLLABORATION. CHANGE.
The Rhode Island Libraries: 
Local Birth of Data Science Training

- The Providence Public Library – Tech. training
- The other Public Libraries - MakerSpaces
- Programs at the institutions of higher education followed
- Robust partnerships with RI Tech Collective and Governor’s office
Growing Demand for Technology and Data Savvy Workforce

- Many different kinds of data scientists
- Many perspectives needed to support robust programs
- Examples:
  - Artists – Data visualization
  - Philosophers – Ethics
  - English/Writing - Communications
Growing Demand for Data Savvy Workforce

- From spreadsheets to Machine Learning Algorithms (Secretarial staff to quants)
- From programming to high end analysis
- Research to support innovation
Universities and Colleges: Who Needs AI and Big Data Problem Solving Skills?

1. Astronomers, oceanographers, bio-scientists, health disciplines
2. Business Analytics
3. Social Scientists
4. Humanities
5. Every discipline
Current Big Data Hot Spots

- New graduates and retrained workers
  - Computational techniques
  - Technical support
  - Business knowledge
  - Ethics

- Thinking about the implications as approaches are developed (environmental, workforce, societal, policy, individuals, underserved groups)
Elements of the Ecosystem
Inspiring/Supporting Education & Research

- Libraries
  - Shared URI position LIB and CS (Assistant Prof Data Science and Co-Dir AI lab)
  - Central portal for consulting and training
    - Workshops (Python, R, SQL, DB design, machine learning, ethics, and more)
    - Place where scholars can find research and consulting partners (beyond the golf course or playground/bus-stop)
RI Data Science Round Table URI 2019

- URI: DS as major/minor, BAI at Business ($15M donation), Planning DS4RI (K12)
- Brown: Master, future PhD and undergrad, data fluency certificate
- Bryant U: BS and master (2 tracks management and practitioner)
- Community College: courses
Partners of Libraries and Universities
Some (Overlapping) Examples

- Junior colleges and technical schools
  - Data cleaning and visualization
  - Programming, domain knowledge, data analysis tools (how to tailor and interpret)

- State government & Non-Profits
  - Workforce training
  - Pathways to academic programs and research
Who’s in charge of DS (I)?

- Computer Science
- i-schools
- Business
- Statistics (Yale)
- Social Data Analytics (Penn State)
- DS Institute (Columbia)
- LIBRARIES (?)
Who’s in charge of DS (2)?

- Mega trends
  - School of DS (UVA)
  - Division of Data ScienceS led by Associate Provost (UCB)
  - MIT College of Computing ($1B)
Programs Informed By ...

- National Academies of Science
  - Interim Undergraduate Data Science Report - https://doi.org/10.17226/24886

- Burning-Glass.com

- Bureau of Labor Statistics
  - New Data Science discipline category
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