

# Industry Panel for Interdisciplinary Computing Summer Institute

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# Objective: Give an Overview

- The current and future demand for people with interdisciplinary computing backgrounds
- The skills for these with interdisciplinary technologists

# Outline

- Myth: AI (NLP + ML specialists) are dream jobs of CS developers
- Facts:
  - There are many other tasks needed beyond NLP and ML algorithms development
  - Many other types of disciplines needed to deliver cognitive APIs on the Cloud
    - Data Scientist
    - Offer Manager
    - Designer

# Everything is about AI?

- Myth: AI is all about NLP + ML (deep learning)
  - AI is not Artificial Intelligence (at least not for the next 5-10 years, not necessarily because of technology, but because of liability)
  - AI is Augmenting Intelligence
- Facts: Equally important are
  - Pre-processing & post-processing → Take much more effort than applying NLP or ML algorithms
  - Formalizing Evaluation Methodology
  - Establishing Repeatable / Scale-out Processes
  - Getting more raw data, better labeling tools, more labeled data
  - Applying one industry / domain at a time
  - Cloud Citizenship

# Establish Repeatable / Scale-out Processes

- Iterations of improving quality (precision / recall)
  - Data Scientists
- Continuous content acquisition → More data
  - Offering Managers
- Continuous ground truth generation → More labeled data
  - Labeling Tools
  - Designers, UI
  - Crowd-sourcing
  - SME Labelers → Data Scientists
  - Apply one industry / domain at a time → More data for different Subdomains

# Data Scientists

- “Data Scientists are more important than NLP and ML specialists”
- Know the relationship with Deep Technology and NLP / ML specialists
- Establish Repeatable / Scale-out Processes
  - Iterations of improving quality (precision / recall)
  - Repeat the same processes one industry / subdomain at a time
- Speak the same language as NLP & ML specialists
- Speak the same language as OM, RM, Designer, ID, UI dev., DevOps
- Understand use cases, and different persona of the software (API, Tools)

# Offering Managers

- Establish Repeatable / Scale-out Processes
  - Continuous content acquisition → More data
    - Offering Managers
  - Continuous ground truth generation → More labeled data
    - Labeling Tools
    - Designer, UI
    - Crowd-sourcing
    - SME Labelers → Data Scientists
    - Apply one industry / domain at a time → More data for different Subdomains
- Offering Managers
  - Explore use cases from potential business partners and sponsored clients
  - Development business propositions
  - Manage continuous content acquisition
  - Manage the processes of continuous ground truth generation

# Designers

- Article on [“How Technology is Forcing Us to Rethink What a Designer Does”](#) by Yazin Akkawi, Founder and principal, MSTQ
  - “many of today's digital designers have skills that make them look more like psychologists, anthropologists, statisticians, economists, artists and business people on paper.”
  - "It makes sense when I look back on my path." Raphael Arar, a designer at IBM Almaden says. "Behavioral economics is the understanding of incentive structures of humans, and music composition, I think, equates to user experiences--to compose music is to create an experience that is time-based and one that guides the listener."
    - Raphael Arar studied behavioral economics and music composition in his undergrad.
  - Many of today's digital designers come from very diverse backgrounds, with fewer designers emerging from actual design school. In fact, a recent report found that 86 percent of designers develop their digital skills outside of their coursework, and instead are learning best-practices on the job.

# Designers

- Article on [“Don’t Just Learn to Code. Silicon Valley Needs More Fuzzies,”](#) by David Ryan Polgar
  - “The tech industry needs more philosophy majors.”
  - “Fuzzies Should Apply.”
  - “In order to adequately grapple with world-changing ideas, we need more well-rounded thinkers.”
  - “Judge a man by his questions, not by his answers.”
  - “The Fuzzy and The Techie,” a book by Scott Hartley, a political science major
    - “Technology is agnostic. We have to imbue it with our own set of principles and our own set of ideals. And that requires lots of divergent, diverse perspectives in the room.”

# Lacking Industrial Experience?

- Agile Methodology and Software Engineering Discipline
  - Daily scrum, stand-up, software engineer discipline (even for CS)
  - Common practices for code managements in team repositories: when to check in code, pull request, master branch
  - Style of coding: think corner cases, think coverage
- Understand the persona of the software you implement
- Understand the roles of people outside development team
  - Offering Manager, Release Manager, Designer, UI Developer, Agile coach, Documentation, DevOps/TestOps, QA
- Understand the big picture