Power what’s possible:
Serving your communities better with Google Cloud Platform
Agenda

Introduction from Google

- Steven Butschi, Head of Higher Education

Manhattan College

- Jake Holmquist, CIO

Carnegie Mellon University

- Michael Madaio, Doctoral Student

Carnegie Mellon University

- Arman Hezarkhani, Undergraduate Student
This is what makes Google Google: its physical network, its thousands of fiber miles, and those many thousands of servers that, in aggregate, add up to the mother of all clouds.
580,000 cores on preemptible VMs

“$10^{17}$ hyperelliptic curves of genus 3 in an effort to find curves whose L-functions can be easily computed, and which have potentially interesting Sato-Tate distributions”

Products used: Google Compute Engine, Cloud Storage, DataStore
MIT Research

580,000 cores on preemptible VMs

300 years of core-years of compute time for $20,000 - not bad for a lazy Sunday!

Products used: Google Compute Engine, Cloud Storage, DataStore
2nd Generation Tensor Processing Unit (TPU) Custom ASIC built and optimized for TensorFlow

Used in production at Google for over 16 months

180 Teraflops!!

and 15-30x faster than CPU or GPU
Google Cloud Platform: Improving IT Operations at Manhattan College
Jake Holmquist, CIO
How is Manhattan College using the (Google) Cloud?

2014  2017
How is Manhattan College using the (Google) Cloud?

Prior to 2014

2008

2010
How is Manhattan College using the (Google) Cloud?

Google Cloud Platform

2014 to present
Google Cloud Phase 1 - October 2014

- Low Risk
- Data-less
- Built in Redundancy
- Easy to back out

DNS Server on Compute Engine
Google Cloud Phase 1 - continued... 2015 to 2016
REGISTER FOR OPEN HOUSE

Prospective students and families are invited to explore campus, meet faculty and students on Oct. 29.
“We’re not buying new servers” -- Director of Enterprise Applications
Google Cloud Phase 2 - Key Milestone - Banner 9

March 2017
Project Proposed

August 2017
Students and Faculty Return
Google Cloud Phase 2 - Key Milestone - Banner 9

Prior to the project
Google Cloud Phase 2 - Key Milestone - Banner 9

On-Premise

Obstacles
- Capital Costs
- Time to Deploy
Google Cloud Phase 2 - Key Milestone - Banner 9
In the Cloud

Banner 9
What’s next?

Cloud First

Work Smarter, Not Harder

- Not just VM to VM (Compute Engine)
- What about?
  - App Engine
  - Cloud Storage
  - Cloud SQL
Key Takeaways

GCP provides us the tools to solve complex problems

HA and Redundancy easy in GCP

Fail Fast (and fail often)

Getting IT out of the datacenter
Using Google Cloud to Design Socially-Intelligent AI
Michael Madaio

Carnegie Mellon University
Human-Computer Interaction Institute
ArticuLab
Carnegie Mellon University
Google Cloud
Academic AI Research

Collect data ➔ Build machine learning models ➔ Deploy in AI system

Google Cloud
Social AI

Rapport between a virtual agent and the user is the social infrastructure for improving task performance.
S A R A

Socially Aware Robot Assistant
RAPT

Rapport Aware Peer Tutor
Tutoring Session

\[x + 15 = 3x + 12\]
OpenFace
Louis-Philippe Morency, CMU
Rapport Detection

Attention Weight

Academic AI Research

Collect data → Build machine learning models → Deploy in AI system
Academic AI Research with GCP

Collect data → Build machine learning models → Deploy in AI system
TensorFlow for Collaborative Modeling

DATA
Which dataset do you want to use?
- [ ] Data 1
- [ ] Data 2
- [ ] Data 3
- [ ] Data 4

Ratio of training to test data: 70%
Noise: 10
Batch size: 21

FEATURES
Which properties do you want to feed in?
- [ ] Feature 1
- [ ] Feature 2
- [ ] Feature 3
- [ ] Feature 4

3 HIDDEN LAYERS
+ 2 neurons
- 2 neurons
+ 2 neurons

OUTCOME
Test loss 0.006
Training loss 0.004

Colors show data, neuron and weight values.
- [ ] Show test data
- [ ] Discretize output

- [ ] Show test data
- [ ] Discretize output

Confidential & Proprietary
Engage with Google

Attend our security session

Cloud Security, Privacy & Data Protection
- Friday, Nov 3, 8-8:50am
- Meeting Room 113B, 100 Level
- James Snow, Security & Compliance Specialist, Google Cloud
- David Ackerman, Chief Digital Officer and Assoc. VP, NYU
- Ron Jarrell, Virginia Tech

Contact our team
edu.google.com/contact

Apply for GCP grants for CS
cloud.google.com/edu