



UNIVERSITY OF
MARYLAND

ROBERT H. SMITH
SCHOOL OF BUSINESS

Teach Big Data and AI for Business

Gordon Gao

Director, Health Insights AI Lab

Co-Director, Center for Health Information and Decision Systems

University of Maryland, College Park

The evolution of the Big Data and AI course at Maryland

	2015	2016	2017	2018
Content	HDFS, MapReduce Hadoop cluster setup Pig, Hive AWS	Retire: Hadoop setup Add NoSQL Add Spark (RDD)	Retire: MapReduce Add Deep Learning -CNN and RNN Python+JupyterNote book	Add:AWS SageMaker and Lambda Spark Dataframe Anaconda for Deep Learning DeepLearning Tuning tips
Format	8 weeks learning 8 weeks client projects	Semester-long learning Industry data	Semester-long learning Kaggle projects	Semester-long learning Kaggle projects

Colleagues: Anand Gopal, KZ Zhang, GT Ozer, Weiguang Wang

Teaching Big Data and AI in the MBA program

- ▶ Started in fall 2017 in Washington DC campus
- ▶ 8-week 2-credit course:
 - ▶ Tu 6:25pm-10:00pm
- ▶ Course format:
 - ▶ first half case discussion
 - ▶ second half technology/coding

Technical

- ▶ Tech topics largely follow the MSIS course, but are lighter and more high level
 - ▶ Why they are developed: concepts and evolution
 - ▶ What they are for: use case of each tool
 - ▶ What's under the hood: hands-on experience
 - ▶ Hadoop and Spark coding
 - ▶ Simple examples to understand DNN, CNN and RNN
 - ▶ MNIST datasets
 - ▶ Cloudera Virtual Machine, AWS education credits, Databricks, Anaconda

Cases used in the MBA course

- ▶ Kyruus – in search of the business value of big data
 - ▶ HBSP case product #: 813060-PDF-ENG
 - ▶ It is not easy to be the Bloomberg of big data.

- ▶ Zillow (KE1008-PDF-ENG) and Climate Corp (516060-PDF-ENG)

- ▶ IBM Watson
 - ▶ 616025-PDF-ENG
 - ▶ How to build AI, and understand the hypes/reality associated with AI

Lesson learned

- ▶ 1. It is hard to teach coding at 9pm
- ▶ 2. Do not shovel too much knowledge to the audience
- ▶ 3. Need to go beyond curiosity: how to put technology to use
- ▶ 4. Need better/current materials on the design, management and evaluation of AI projects

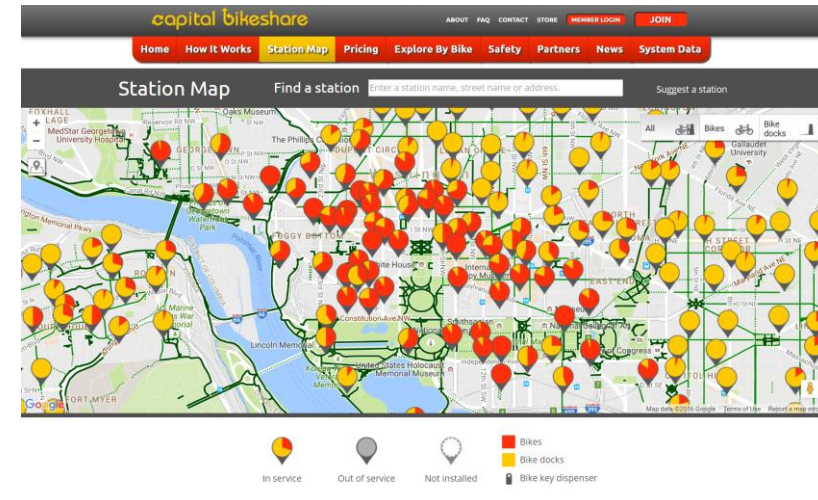
Student tastes – which one is more popular?

▶ Dataset 1: Capital Bike Share

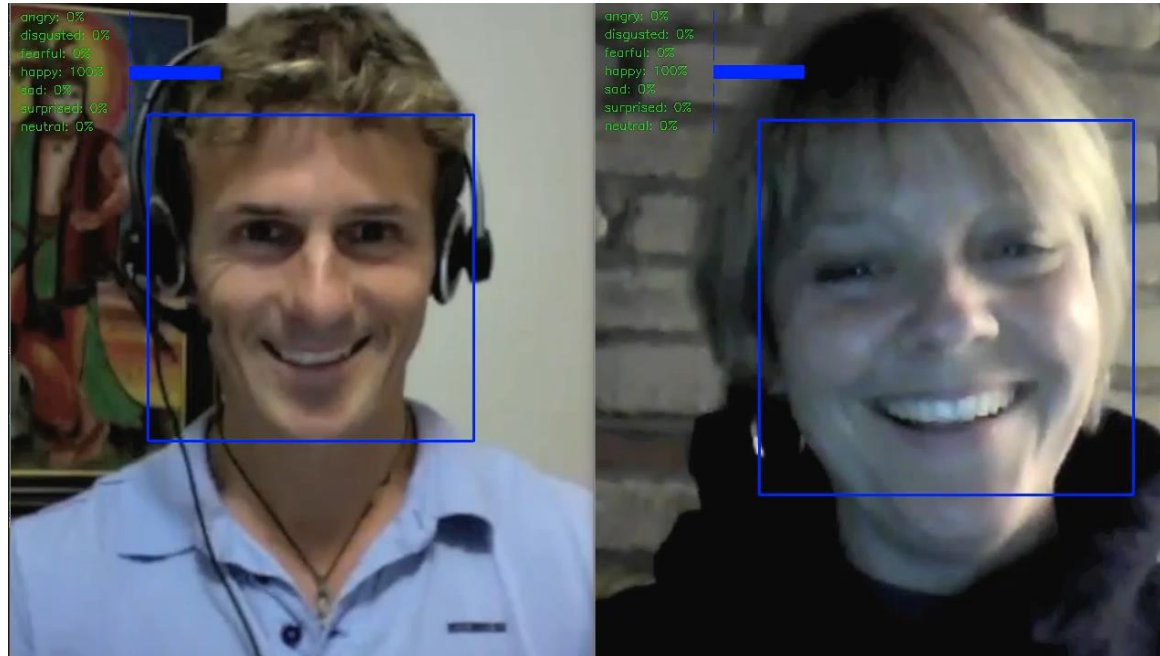
- ▶ Year 2010-2016, Over 350 stations
- ▶ Each trip's starting and ending point,
- ▶ Trip's Date and time
- ▶ Membership type

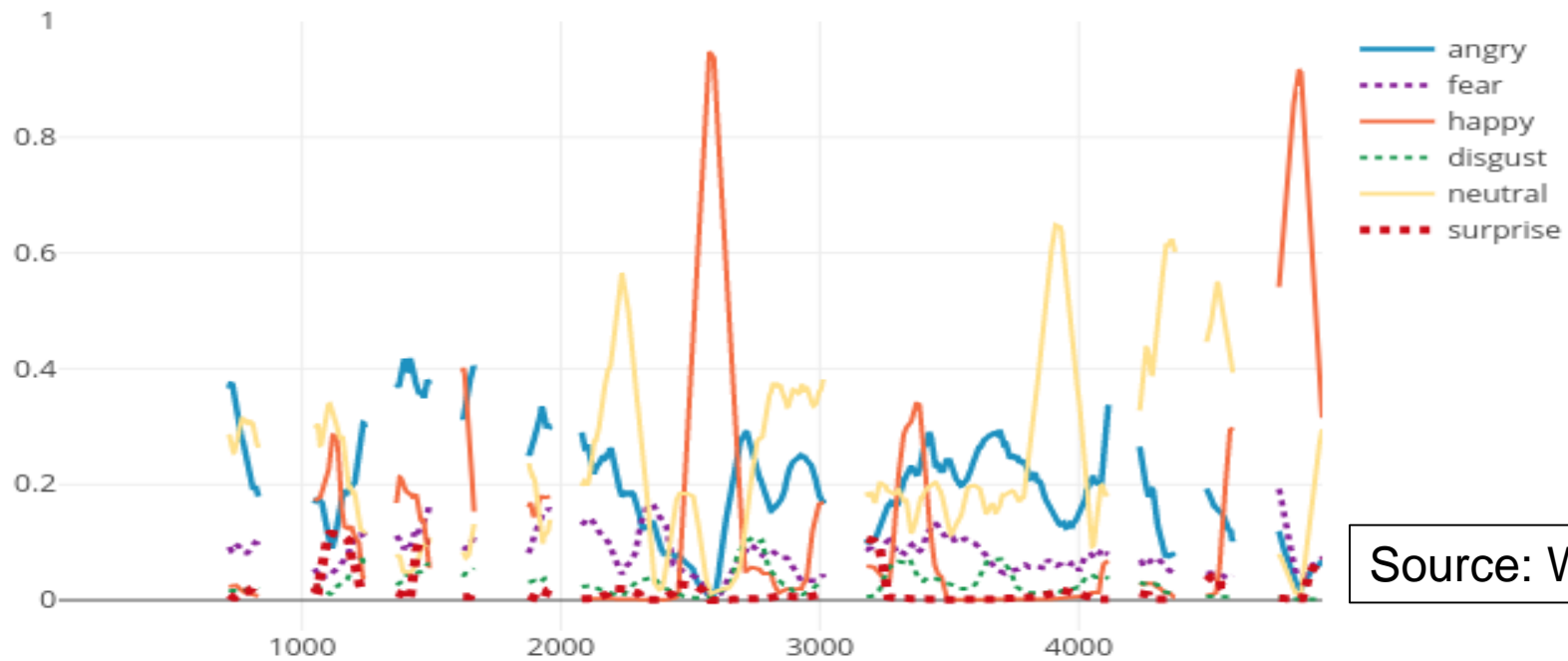
▶ Dataset 2: Mortality

- ▶ Death record from CDC
- ▶ 2005-2015,
- ▶ including their health condition, cause of death, and demographics.



Challenges in incorporating research to teaching





Source: Wang, et al 2019

James Doe
Male DOB: 1/3/21/1932

04/01/2016 - Office Visit: office visit
Provider: Jane White MD
Location of Care:

Cardiology Office Visit Note

Patient Review
Date of service: 04/01/2016 1:16 PM

Impression & Recommendations:

Problem # 1: CAD (ICD-414.00) (ICD10-I25.10)
jaw pain with exertion, had negative cath in 2012 in the setting of chest and jaw pain will get a stress test cardiac meds

Problem # 2: ESSENTIAL HYPERTENSION (ICD-401.9) (ICD10-I10)
elevated blood pressure today, he did not take his medicine yesterday or today, discussed the importance of compliance, I suspect his angina could be related to hypertension

Medicare
HCC88 - Angina Pectoris
on high dose Crestor

Problem # 4: ATRIAL FIBRILLATION (ICD-427.31)
I cannot find documentation of atrial fibrillation on any rhythm strip electrocardiogram. Continue aspirin. He could not tolerate beta blockers in the past. He will need anticoagulations he has evidence of atrial fibrillation.

- Patient Instructions:**
- 1) Please schedule a follow-up appointment in 1 year.
 - 2) please schedule a Lexiscan stress test
 - 3) Please take blood pressure medications daily and check blood pressure at home

- Current Problems**
- Jaw pain (ICD-784.92) (ICD10-R68.84)
 - EXAMINATION, PREOPERATIVE CARDIOVASCULAR (ICD-V72.81) (ICD10-Z01.810)
 - ATRIAL FIBRILLATION (ICD-427.31)
 - COPD (ICD-496) (ICD10-J44.9)
 - SLEEP APNEA (ICD-780.57) (ICD10-G47.30)
 - ESSENTIAL HYPERTENSION (ICD-401.9) (ICD10-I10)
 - CHF (ICD-428.0)
 - HYPERCHOLESTEROLEMIA (ICD-272.0) (ICD10-E78.0)
 - CAD (ICD-414.00) (ICD10-I25.10)

Search Comments...

11 Comments [Sort/Filter]

Page 4 6

Medicare
HCC88 - Angina Pectoris

Medicare
HCC96 - Specified Heart Arrhythmias

Medicare
HCC96 - Specified Heart Arrhythmias

Medicare
HCC96 - Chronic Obstructive Pulmonary Disease
HCC111 - Specified Heart Arrhythmias

Medicare
HCC111 - Chronic Obstructive Pulmonary Disease

Medicare
HCC85 - Congestive Heart Failure

Page 5 3

Medicare
HCC96 - Specified Heart Arrhythmias

