research at the intersection of
ai and
social sciences/humanities

bhargav srinivasa desikan

about me

- research fellow at knowledge lab, university of chicago
- interested in the philosophy, history, and sociology of ai
- author of nlp book, published in cognition and jmlr
- 2013A7TS053G

this talk is not

- a summary of the relationship between ai and society

this talk is

- showcases two ways to study this relationship:
- use ai/ml to study society
- use social science/humanities to study ai/ml
- examples of research I have been a part of and research which has deeply influenced me

flows of knowledge

- my ma thesis, funded by burning glass, jobs and skills analytics company, supervised by prof james evans and prof luis bettencourt

- how can we study the knowledge economy?

- relate research at universities to their teaching, relate industry research and academia, see how spatial similarities and semantic similarities effect research

- how do you measure semantics?

flows of knowledge

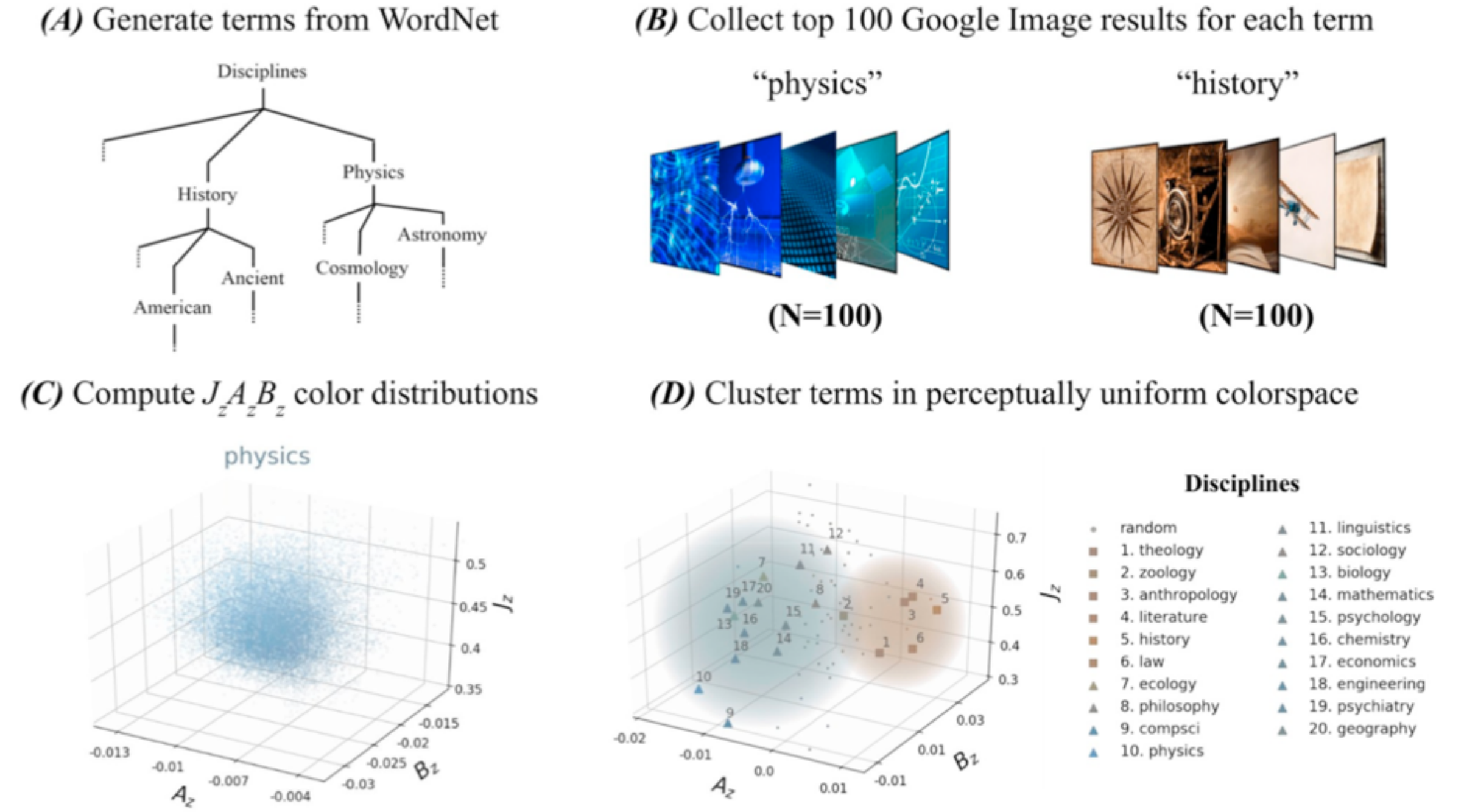
- create semantic vectors of research, teaching, and industry
- use these vectors to measure relationships between different entities
- do universities in different rankings teach or research differently?
- do universities in different states teach or research differently?

computational synaesthesia
comp-syn

- sante fe institute's complex systems summer school 2019, 6 scientists + 1 painter (and 2 bitsian alumni!)
- published in cognition, under review at coling'20
- uncovering relationship between words and colors

computational synaesthesia
comp-syn

- use google image search to get top 100 images of a word
- create a human perceptible color distribution of each image, average all 100 images for each word
- you now have an average color distribution for each word, or a color vector
- using this to demonstrate the “syneasthetic” nature of words


(A) Generate terms from WordNet
Disciplines
History
Physics
American
Ancient
Cosmology
Astronomy
(B) Collect top 100 Google Image results for each term
"physics"
"history"
(N=100)
(N=100)
(C) Compute $J_zA_zB_z$ color distributions
physics
0.5
0.45
0.4
0.35
J_z
-0.013
-0.01
-0.007
-0.004
A_z
-0.015
-0.02
-0.025
-0.03
B_z
(D) Cluster terms in perceptually uniform colorspace
0.7
0.6
0.5
0.4
0.3
J_z
-0.02
-0.01
0.0
0.01
A_z
0.03
0.01
-0.01
B_z
Disciplines
random
1. theology
2. zoology
3. anthropology
4. literature
5. history
6. law
7. ecology
8. philosophy
9. compsci
10. physics
11. linguistics
12. sociology
13. biology
14. mathematics
15. psychology
16. chemistry
17. economics
18. engineering
19. psychiatry
20. geography

computational synaesthesia
comp-syn

- abstract semantic domains have statistically significant color associations

- for abstract concepts like democracy, happiness, mathematics, etc., the average color distributions cluster within the category

- for e.g in music, blues and disco cluster together, and techno and metal cluster; in academic disciplines history and literature cluster, and computer science and physics cluster

- we created 40,000 color vectors to now perform much wider analysis, this work is currently under review

critically thinking about ai through science and technology studies

- flip the paradigm; now we use anthropology, sociology, science and technology studies (STS), critical theory to study how ai effects society, and how ai researchers function

- wide variety of very important literature (e-mail me and I'll send you a list!)

- the social nature of ai

ai & society

- ai used in systems such as prison, and surveillance
- ai used in finance and banking; loan decisions
- ai used in photography and photography science
- ai based on personal data used for micro targeted marketing and political advertising

ai & society

- data reflects human biases
- privacy, consent, and ownership of data
- representation in health care and medical datasets
- age of surveillance capitalism

two recommendations!

- beautiful data - orit halpern
- race after technology - ruha benjamin

what can we do?

- our work is necessarily socially situated
- critically think of the consequences of your work and its contributions to society
- if you are using class, race, sexuality and other personal attributes in your data, is it bias free : also, what are you trying to measure using those characteristics?
- our responsibility working in this sphere to make sure we don't allow misuse of ai

summary

- many ways to think about the relationship between ai & society

- reflexive, two way study between social sciences/humanities and computer science is what is needed to have a more complete understanding

thank you!

- @bhargavvader - github, twitter, gmail, instagram
- happy to chat about research ideas and answer questions :)