chandan singh

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education

phd | machine learning

uc berkeley | '17-'22
research: interpretable ml
advisor: bin yu
collaborators:
a. kornblith (medicine)
s. upadhyayula (biology)

bs | cs & math

university of virginia | '14-'17
double major

skills

machine learning
deep learning • pytorch
rule-based models • data cleaning
causal inference • pycharm
experienced
python • java • matlab
proficient
r • c/c++ • web basics
human languages
english • spanish • hindi

awards

berkeley grad slam semifinalist '19, '22
outstanding teaching award '18
uva rader research award '17
uva undergrad symposium winner '17
raven honor society '16-'17
icpc regional qualification '14-'16
1st place microsoft code jam '16
3rd place google games uva '17
2nd place apt puzzle competition '17

funding awards
pdsoros fellowship finalist '19
ircn workshop travel award '19
vidya shelat fund award '16
rodman scholarship '14-'17

experience

microsoft research | senior researcher (deep learning lab)

summer '22 - present

- improving the interpretability of language models
- researching scientific/medical knowledge discovery with language models

berkeley | interpretable ml research (bin yu lab 🔗)

fall '17 - spring '22

- developed post-hoc interpretation methods for ml models (e.g. neural nets)
- developed interpretable models in medicine, biology, and computer vision

paige ai | ai research scientist

summer '21

- interpretable deep learning in digital pathology (especially bladder cancer)

aws | ml fairness internship (pietro perona lab 🔗)

summer '20

- testing for bias with causal matching using GANs
- interpreting semantic directions in generative models

response4life | volunteer data scientist

spring '20

- helped develop, integrate, and deploy models to forecast covid-19 severity

pacmed ai | healthcare ml internship

summer '19

- developed techniques to interpret machine-learning models for healthcare
- integrated interpretability techniques for predicting icu re-admission

meta ai | computer vision internship

summer '17

- investigated unsupervised deep learning for segmentation of satellite imagery
- implemented crfs for segmentation post-processing

uva | ml research (yanjun qi lab 🔗)

fall '16 – spring '17

- developed multi-task graphical models for analyzing functional brain connectivity

hhmi | ml research (srini turaga lab 🔗)

summer '14, '15, '16

- improved cnns and watershed algorithms for neural image segmentation
- analyzed backpropagating action potentials via biophysical simulations

uva | comp. neuroscience research (william levy lab 🔗)

fall '14 - fall '16

- developed detailed biophysical models of neural computation
- analyzed energy efficiency, noise, and variability in stochastic neurons

coursework

computation

machine learning
computer vision
structure learning
algorithms
artificial intelligence
deep learning
learning theory
ai in graphics
cs theory
data structures
software dev. I & II
information retrieval
computer architecture

stat/math

statistical models
probability
statistics
optimization
linear algebra
info theory
real analysis
linear models
stochastic processes
chaos theory I & II
multivariate calculus
discrete mathematics
differential equations
abstract algebra

neuroscience

neural coding
neural network models
neurobiology
visual neuroscience
cognitive science

selected publications

interpretability × language models

- augmenting interpretable models with llms **cs**, askari, caruana & gao, *arXiv, '23* 🔗 </>
- tree prompting morris*, **cs***, rush, gao, & deng *emnlp, '23* 🔗 </>
- explaining black box text modules in natural language **cs***, hsu*, antonello, jain, huth, yu & gao, *arXiv, '23* 🔗 </>
- explaining data patterns in natural language **cs***, morris*, aneja, rush, & gao *emnlp workshop, '23* 🔗 </>

interpretability × deep learning

- interpretable, adaptive wavelet distillation from neural networks: ha, **cs**, et al. *neurips '21* 🔗 </>
- aligning neural networks by regularizing explanations: rieger, **cs**, murdoch, & yu, *icml '20* 🔗 </>
- hierarchical interpretations for neural network predictions: **cs***, murdoch*, & yu, *iclr '19* 🔗 </>

interpretabity × rules

- imodels: a python interpretability package: **cs***, nasseri*, tan, tang, & yu, *joss '21* 🔗 </> 🌐
- fast interpretable greedy-tree sums: tan*, **cs***, nasseri*, agarwal* et al. *arxiv '22* 🔗 </>
- hierarchical tree shrinkage agarwal*, tan*, ronen, **cs**, & yu *icml '22 (spotlight)* 🔗 </>

real-world data science

- curating a covid-19 data repository and forecasting county-level death counts in the united states: altieri, barter, ..., **cs***, ..., & yu* *harvard data science review '20* 🔗 </>
- stress testing a clinical instrument for abdominal injurykornblith*, **cs***, et al. *plos digital health* 🔗 </>

teaching

berkeley | student instructor

summer 2018
machine learning: cs 189/289 🔗
lectures to class of 80+ students

fall 2019
artificial intelligence: cs 188 🔗

mini-projects

paper notes 🔗	'14-now
blog, & slides 🔗 </>	'14-now
hummingbird tracking 🔗 </>	'18
news balancer django app </>	'17
java mini-games </>	'14-'16

service

basis education volunteering	'19-'22
bair undergrad mentoring	'18-'22
neurips reviewer	'20, '21, '23
acl rolling reviewer	'22
iclr reviewer	'21
cvpr reviewer	'21
aaai reviewer	'21
computer literacy volunteering	'15-'17