chandan singh

cs1@berkeley.edu | csinva | csinva.io | csinva

education

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

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)
fall '22 - present
- research on interpretable deep learning

berkeley | interpretable ml research (bin yu lab)
fall '17 - spring '22
- developed 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 | 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

interpretable deep learning

- adaptive wavelet distillation from neural networks through interpretations: ha, **cs**, et al. *neurips '21* </>
- interpretations are useful: penalizing explanations to align neural networks with prior knowledge: rieger, **cs**, murdoch, & yu, *icml '20* </>
- hierarchical interpretations for neural network predictions: **cs***, murdoch*, & yu, *iclr '19* </>
- interpretable machine learning: definitions, methods, and applications: murdoch*, **cs***, kumbier, abbasi-asl, & yu, *pnas '19*

interpretable rule-based modeling

- imodels: a python package for interpretable modeling: **cs***, nasseri*, tan, tang, & yu, *joss '21* </> 800+ stars
- fast interpretable greedy-tree sums (figs): tan*, **cs***, nasseri, agarwal, & yu *arxiv '22* </>
- hierarchical shrinkage: improving accuracy and interpretability of tree-based methods: 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* </>
- predictability and stability testing to assess clinical decision instrument performance for children after blunt torso trauma kornblith*, **cs***, et al. *plos digital health* </>
- interpretable deep learning for accurate molecular partner prediction in clathrin-mediated endocytosis: **cs***, li* et al. *in prep* </>

applied computer vision

- large scale image segmentation with structured-loss-based deep learning for connectome reconstruction: funke et al. *tpami '18* </>
- matched sample selection with GANs for mitigating attribute confounding: **cs**, balakrishnan, & perona *cvpr '21 civ workshop* </>

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

notes, blog, & slides </>	'14-'20
hummingbird tracking </>	'18
news balancer django app </>	'17
java mini-games </>	'14-'16

service

basis education volunteering	'19-'22
bair undergrad mentoring	'18-'22
acl rolling reviewer	'22
neurips reviewer	'21
iclr workshop reviewer	'21
cvpr reviewer	'21
aaai xai workshop reviewer	'21
neurips ml4h workshop reviewer	'20
computer literacy volunteering	'15-'17