Vanessa Martina Böhm

Physicist and Cosmologist with 6 years of experience solving statistical, numerical and theoretical problems seeking to apply her skills to earthbound problems.

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SELECTED WORKS

Probabilistic Auto-Encoder

This deep generative model produces state-of-the-art results in sample quality and outlier detection accuracy. [1]

DEEPUQ- Deep Bayesian Uncertainty Quantification

This framework exploits neural network based generative models for solving Bayesian inverse problems in high dimensions [2] (Accepted for publication at the NeurIPS 2019 BDL Workshop)

WORK EXPERIENCE

Postdoctoral Fellow - Physics Department, UC Berkeley

Nov 2017 - PRESENT

- developed machine learning algorithms for statistical data analysis including outlier detection and high dimensional posterior analysis
- applied ML models in various data analysis projects
  - estimating COVID-19 fatality rates
  - uncovering COVID-related trends in applications for the CA food stamp program
- advanced differentiable simulation codes for cosmological data analysis
- derived theory for modeling systematics in cosmological data

PhD Candidate - Max-Planck Institute for Astrophysics (MPA)

Oct 2013 - Oct 2017

- solved Bayesian inverse problems in cosmology
- developed methods for extracting non-Gaussian information from cosmological observables

EDUCATION AND DEGREES

PhD - Ludwig-Maximilian University (LMU), Munich, Germany

graduated *summa cum laude*

Master of Science (Physics)- Heidelberg University, Germany

Graduation with *1.0* (4.0 in the US system [3])

Computational Skills

- Python, C++, PyStan
- tensorflow, keras, scikit-learn
- pandas, dask, mpi4py
- git, anaconda, bash

EXPERTISES

(Deep) Learning

- generative models
- regression
- classification
- outlier detection
- clustering analysis

Bayesian Statistics

- inverse problems
- optimization
- sampling algorithms

N-body Simulations

- code development
- data analysis

LANGUAGES

German - native

English - fluent

FELLOWSHIPS

Scholar of the German Academic Exchange Service [DAAD], Aug 2012-May 2013

OUTREACH & VOLUNTEERING

Judge for [Jugend Forscht] (2014-2017)

Student mentor in the [Heidelberg Life-Science Lab] (2008-2013)