Dr. James Kahn

Email:	kahn.jms@gmail.com	Nationality:	Australian
GitHub:	github.com/kahn-jms	Languages:	English (native)
Google scholar:	James Kahn		German (level B1, 1)

Expertise

Computing

- Python, C/C++, Java
- Grid and HPC administration/development
- Collaborative programming (CI/CD)

Data science

- PyTorch, Tensorflow/Keras, Graphcore
- Pandas, NumPy, Scikit-learn
- Computer vision, Graph learning

Employment

Helmholtz AI — 2020 – present

Senior AI consultant, Germany

AI consultant for energy researcher clients, leading & supporting role for research projects within the Helmholtz association to accelerate research outcomes with AI expertise & HPC resources.

Key roles:

- Principle Investigator (P.I.) of €100k project grant on structural vulnerabilities of AI's integration into microgrids (project lead of five person team).
- Supervisor of multiple PhD research projects on the topics of solar plant operations, urban retrofit planning, and district heating monitoring.
- Developer for AI solutions and packages leveraging HPC resources.
- Publishing collaborative fundamental AI research within both national and international research collaborations.

Steinbuch Centre for Computing (SCC) — 2019 – 2020

Postdoctoral fellow, Germany

Dual position working as Belle II liaison and operations support for GridKa Tier-1 site, and as machine-learning researcher and supervisor for local Belle II physics team.

Key roles:

- Manager of Belle II experiment computing resources at GridKa Tier-1 site.
- Systems administration and development for GridKa operations support.
- Manager of Belle II raw data setup and testing, and BaBar experiment raw data transfer and hosting.
- Supervisor of four Master's students in Belle II team for machine-learning research.

ARC Centre of Excellence for Particle Physics at the Terascale (CoEPP) 2011 – 2013

Research computing assistant, Australia

Designed and implemented cloud-hosted batch queue system (Tier-3) used by Australian physics researchers working on the ATLAS and Belle experiments.

Experience with Linux systems administration (RHEL, SL, Debian), automated configuration (Puppet, CFEngine), monitoring (Ganglia, Nagios), network administration (DHCP, Kerberos), and job automation (Torque)

Publication highlights

Articles

Thermal Bridges on Building Rooftops (TBBR)
Nature Scientific Data (in review), 2022

Soiling Determination For Parabolic Trough Collectors Based on Operational Data Analysis and Machine Learning
Solar Energy (in review), 2022

Deep Learning Approaches to Building Rooftop Thermal Bridge Detection from Aerial Images
Automation in Construction, 2022

Learning Tree Structures from Leaves For Particle Decay Reconstruction
Machine Learning: Science and Technology, 2022

Punzi-loss: A non-differentiable metric approximation for sensitivity optimisation in the search for new particles
The European Physical Journal C, 2022

Accelerating neural network training with distributed asynchronous and selective optimization (DASO)
Journal of Big Data, 2022

Proceedings

AI-based thermal bridge detection of building rooftops on district scale using aerial images
EG-ICE 2021 Workshop on Intelligent Computing in Engineering, 2021

Punzi-loss and Punzi-net, outperforming standard MVA techniques in the search for new particles of unknown masses
20th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2021), 2021

A Proposed High Dimensional Kolmogorov-Smirnov Distance
Machine Learning and the Physical Sciences: Workshop at the 34th Conference on Neural Information Processing Systems (NeurIPS), 2020

Selective background Monte Carlo simulation at Belle II
24th International Conference on Computing in High Energy and Nuclear Physics (CHEP 2019), 2020

Education

Ph.D. Physics — Ludwig-Maximilians-Universität München, 2016 – 2019

(Magna cum laude)

Hadronic Tag Sensitivity Study of $B \to K^{(*)}\nu\bar{\nu}$ and
Selective Background Monte Carlo Simulation at Belle II
Supervisor: Prof. Dr. Thomas Kuhr

Prepared analysis of $B \to K^{(*)}\nu\bar{\nu}$ using Belle II Analysis Software Framework with measurement projections for upcoming data taking.

Developed package for reducing Monte Carlo simulation resource requirements using deep learning.

Connected local distributed compute as available resources to the Belle II computing grid.

Contributed to the collaboration analysis software framework and physics tools.

Tutor for *E5: Kern- und Teilchenphysik* undergraduate courses.

Master of Science (Physics) — The University of Melbourne, 2013 – 2015

Investigations of $B^0 \to K^0_S\pi^0$ decays with the Belle experiment
Supervisor: Assoc. Prof. Martin Sevior

Investigated new technique in signal-background discrimination to extract $B^0 \to K^0_S\pi^0$ decays within the Belle experiment.

Bachelor of Science — The University of Melbourne, 2010 – 2012

Major in Physics