Vincent Dumont

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EDUCATION

UNIVERSITY OF NSW
PhD in Astrophysics
2013.06 - 2018.08 | Sydney, Australia
Thesis: Tests of Fundamental Physics using quasar spectroscopy.

UNIVERSITY OF CHILE
MSc in Astronomy
2010.03 - 2012.10 | Santiago, Chile
Thesis: Systematic search of deuterium absorption lines in VLT/UVES spectra of distant quasars.

JOSEPH FOURIER UNIVERSITY
BSc in Physics
2006.09 - 2009.07 | Grenoble, France
Thesis: Performance study and improvement of reconstruction algorithms for hadronic jets in LHC's ATLAS experiment.

LINKS

LinkedIn:// **vadumont**
Gitlab:// **vincentdumont**
PyPI:// **vdumont**
arXiv:// **dumont_v_1**
GoogleScholar:// **xc3Xe1kAAAAJ**
ResearchGate:// **Vincent_Dumont**
ORCID:// **0000-0002-4718-1051**

SKILLS

TECHNICAL
C++ • C# • CUDA • Emacs • FFT • Fortran • GSL • HDF5 • IDL • Jupyter • LabView • LAPACK • Mathematica • Matlab • MCMC • Org-mode • Pandas • Python • PyTorch • SLURM • Sphinx • TensorFlow • Wavelet transform

SOFT SKILLS
Fluent in French, English and Spanish.

INTERESTS

Atomic magnetometry • Deep Learning • High-performance computing • Hyperparameter optimization • Long-slit echelle spectroscopy • Quasar astronomy • Observational cosmology • Sensor network technology • Uncertainty quantification • Urban Science

RESEARCH EXPERIENCE

LAWRENCE BERKELEY NATIONAL LABORATORY | Postdoc
Feb. 2019 - Present | Berkeley, CA

- Explore deep learning applications for Distributed Acoustic Sensing data.
- Build data analysis Python software package highly-scalable on HPC systems.
- Use **Hessian-based optimization algorithm** for model training.
- Build PyTorch classifier to identify coherent energies in large seismic datasets.
- Perform latent space visualization for surface wave signal clustering.
- Use MATLAB to do phase-weighted stack for subsurface characterization.
- Develop physics-informed neural network for surface wave inversion problems.

UNIVERSITY OF NEVADA, RENO | Research Scientist
Aug. 2018 – Feb. 2019 | Reno, NV

- Use Bayesian statistics to search for dark matter topological defects.
- Do performance benchmarking of covariance matrix inversion using LAPACK.
- Calculate probability density function of effective coupling strength.
- Write MCMC simulations in C++ to do detection probability evaluation.

UNIVERSITY OF CALIFORNIA, BERKELEY | Research Scientist
Jul. 2016 – Aug. 2018 | Berkeley, CA

- Data analysis coordinator of the **GNOME** international collaboration.
- Maintain JupyterHub server and data storage facilities.
- Maintain two nonlinear magneto-optical rotation atomic magnetometers.
- Build Python software to do coincidence search for exotic transient signals.
- Develop wavelet transform tools to explore the magnetic pulse of cities.

SOFTWARE PACKAGES

alphaqso	Fine-structure constant and spectral distortion analysis package.
gdas	Coherent searching tool for magnetic Dark Matter signals.
llabs	Automatic detection of Lyman-limit regions in quasar spectra.
mldas	Machine learning package for Distributed Acoustic Sensing data.
nuri	Sensor network analysis software for urban magnetometry data.
qscan	Quasar spectra scanning and first guess Voigt profile modelling tool.
qsotools	Easy-to-use analysis tools for quasar spectroscopy research.
velplot	Plotting program for quasar absorption line systems.

PUBLICATIONS

2020 **Dumont et al.** – *NeurIPS 2020, ML for Physical Sciences workshop*
2020 **Dumont et al.** – *IEEE Big Data conference 2020, pp. 1293-1300*
2020 **Hu et al.** – *MNRAS, 500(1), 1466–1475*
2020 **Masia-Roig et al.** – *Phys. Dark Universe, Volume 28, 100494*
2020 **Wilczynska et al.** – *Science Advances, Volume 6, No. 17*
2019 **Bowen et al.** – *Geosci. Instrum. Method. Data Syst, 8(1), 129-138*
2018 **Afach et al.** – *Phys. Dark Universe, 22, 162-180*
2018 **Zavarygin et al.** – *MNRAS, 477(4), 5536–5553*
2017 **Bainbridge et al.** – *Universe 2017, 3(2), 32*
2017 **Riemer-Sørensen et al.** – *MNRAS, 468(3), 3239–3250*
2017 **Dumont & Webb** – *MNRAS, 468(2), 1568-1574*
2015 **Riemer-Sørensen et al.** – *MNRAS, 447(3), 2925- 2936*
2012 **Noterdaeme et al.** – *A&A, 542, L33*