Tom Hands

Date of Birth: 21st June 1990
Citizenship: British Citizen
Address: Friedheimstrasse 24, 8057 Zurich
email: tom@tomhands.com
web: http://www.tomhands.com
phone: +41 76 500 89 16

Technical Skills

- Extensive C++/object-oriented experience, particularly in high performance computing.
- Experience of code development and optimisation on a variety of platforms, including parallel, vector and GPU computing, and usage of HPC systems.
- Wide variety of numerical modelling experience,
- Experienced in C, C#, OpenCL, Kotlin and Java development, working knowledge of FORTRAN.
- Extensive Python experience including numpy, scipy, scikit-learn, tensorflow, xgboost.
- Git and version control.
- Experience using TensorFlow/Keras to build neural networks and XGBoost for classification and regression purposes.

Practical Experience

10/2016–4/2022 **University of Zürich**

Post-doctoral Research Assistant with Prof. Dr. R.Helled, Dr. J.Stadel, Prof. Dr. B. Moore

- Modelling outer solar-system dynamics and continuing my work in planetary migration.
- Ported large sections of my parallel C++ *N*-body code to OpenCL to enable GPU computations.
- Developed and implemented a novel time-stepping scheme to improve simulation accuracy with faster run-times.
- Used this code to run massive parallel simulations on the UZH S3IT supercomputer, as well as Piz Daint.
- Published 9 papers (4 first author).

6/2016 - 9/2016 **University of Leicester**

Post-doctoral Research Assistant – Supervisor: Prof. Dr. Richard Alexander

- Ran OpenMP and OpenMPI simulations using my code and others on the University of Leicester ALICE supercomputer.

2012 - 2016 *Ph.D student* – Supervisor: Prof. Dr. Richard Alexander

- Re-wrote an existing code to model astrophyiscal discs from scratch in C++, achieving a 10x speed-up vs the original version.
- Developed a new, OpenMP parallel C++ code to solve gravitational systems.
- Used git for version control of this code.
- Developed a Python module to analyse and visualise data from such simulations.
- Taught a 3rd year undergraduate class how to program in C++.
- Published 2 papers.

Education

2012–2016 *PhD in Astrophysics*, awarded: August 2016 – Supervisor: Prof. Dr. Richard Alexander

- Thesis title: "The enthralling tale of the formation and evolution of compact planetary systems".

2008–2012 *MPhys (Physics) with First Class Honours*

- Masters dissertation title: "The trajectory of emboli in the major cerebral arteries".
- Bachelors dissertation title: "A method to correct field non-uniformity in images acquired from a phased array MRI head coil".

2011 *Summer Studentship* – Supervisor: Prof. Walter Dehnen

- Title: "Artifical Conductivity in Smoothed Particle Hydrodynamics".

Awards & Research Grants

- Universität Zürich Forschungskredit Fellowship 2019
- Tomalla Fellowship 2018
- STFC Ph.D. studentship 2012
- Awarded departmental prize for being the top performing final year MPhys (Physics) student

Languages

- English (native),
- German (Up to ELP B2 level)

Extra-curricular activities

2022-present Developed and released an indie video game called "Cat Herders" in C# using the Unity engine (https://store.steampowered.com/app/2183920/Cat_Herders_Couch_Coop_Cat_Corralling/)

2015-2022 Peer-review referee for *AAS Publishing*, *A&A* and *Computer Physics Communications*

4/2014 *Exoplanet fly-by video* - YouTube video with over 65,000 views designed to demonstrate the vast variety of planetary systems to a general audience (https://www.youtube.com/watch?v=Nw_KfDEypTY).

2013 *ExoVis* - Developed the exoplanet visualisation tool *ExoVis* in HTML, CSS and Javascript, to aid with the visualisation of exoplanetary systems (http://tomhands.com/exovis/). This tool won the 2013 Open Exoplanet Catalogue visualisation prize.