

Hi, I'm Daniel.

Science rules!

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Education:

B.Sc. in Science from York University. Graduated January 2021.

SafeSump Inc.

Founder/CTO of four-year project to design and produce a failure-resistant water pump system. Funded by:

- \$37,500 Ontario Centres of Excellence [grant #26828](#) (2016-2020)
- \$75,000 government [contract](#) through Federation of Canadian Municipalities (2018-2020).

Broad overview of skills gained:

- **Electronics:** Custom hardware development from in-house prototyping to volume production; design of ultrasonic and capacitive sensors
- **Software and firmware:** Writing and maintaining a 20k SLOC codebase of Python and embedded C and C++ on STM32 and SAM devices. Version control, frontend and backend programming; Linux administration.
- **Soft skills:** Pair programming, management, conducting presentations, collaboration

Kesti Engineering Ltd.

Occasional board-level repair on Mazak and Haas CNC machines. A successful repair documented [here](#).

Vacuum systems

github.com/0xDBFB7/ionprinter/: A multi-year attempt to explore high-current ion beam lithography.

Spinoff projects:

- a GPU-accelerated Particle-In-Cell program called [Nyion](#)

- An inexpensive silicon carbide [furnace](#):

An attempt to make various high-performance ceramic techniques available to a broader audience. Built on the work of more than 200 scientific papers.

- An [inexpensive aftermarket controller](#) for Varian Turbo-V200 series of turbomolecular pumps

- [Control software](#) for an Inficon BPG-400 vacuum gauge

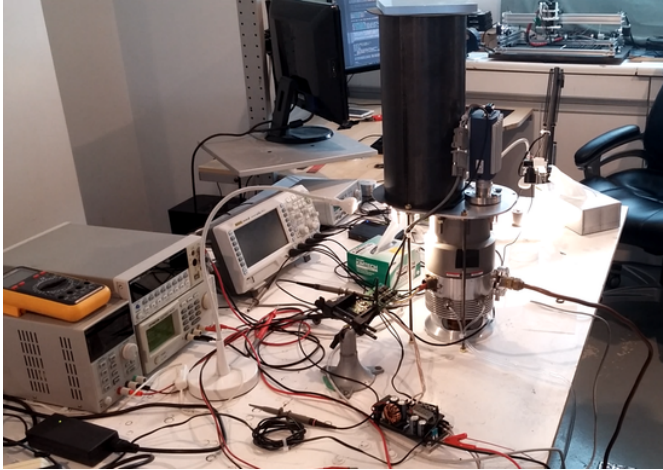
Some notes and experiments on the electroporabilization of viral membranes

Technical report at doi:[10.5281/zenodo.4568507](https://doi.org/10.5281/zenodo.4568507)

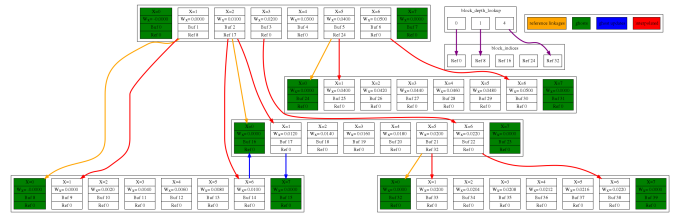
Personal:

Member of SimCoLab Barrie (now BRiX) hackerspace for 7 years.
Canadian and German citizenship.

1 Gallery

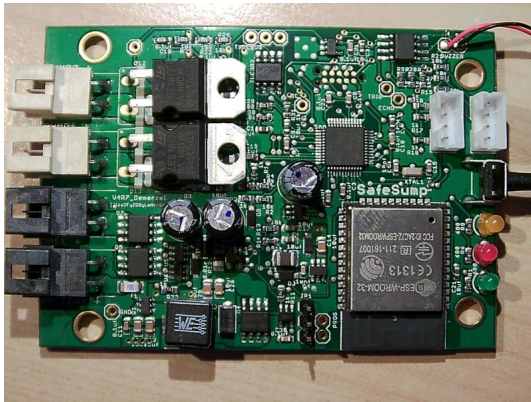


(a)

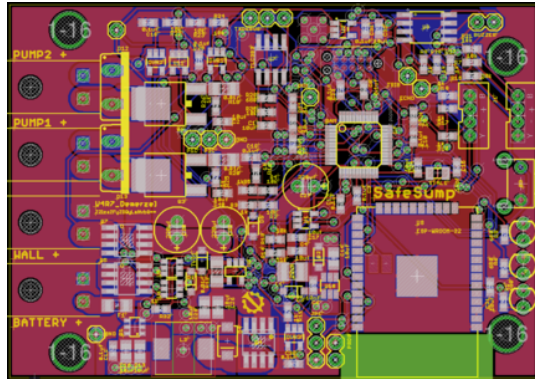


(b)

A bespoke high-vacuum system. GPU-accelerated multigrid data structure and electrostatics solver for particle-in-cell ion beam simulation.

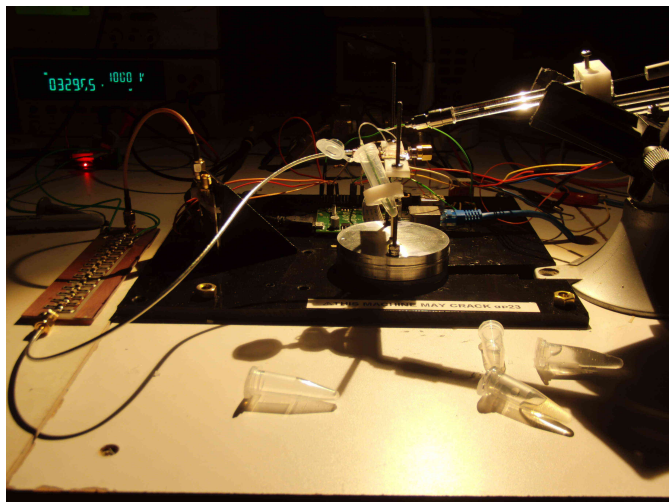


(c)

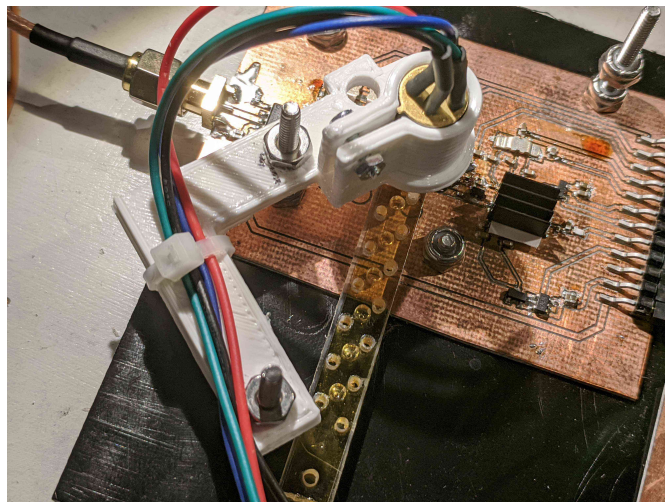


(d)

Redundant controller I designed for SafeSump Inc.



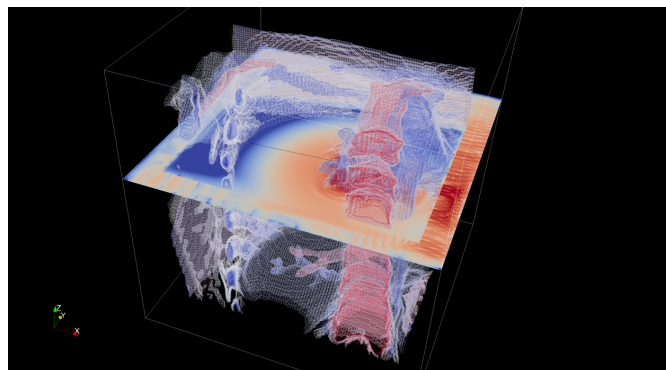
(e)



(f)



(g)



(h)

- (a) A sub-nanosecond kilovolt pulse exposure cell (based on an off-the-shelf avalanche transistor pulser design).
- (b) A 12 GHz microwave absorption spectrometer.
- (c) The very pretty opalescent blue culture caused by *E. coli* B trying to metabolize lactose in an indicator for the enzyme β -galactosidase.
- (d) An FDTD simulation of electromagnetic interaction with tissue.