Elijan J. Mastnak

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General Information

Citizenship: United States and Slovenia (an EU member state)
Fluent languages: English, Slovene, Spanish
Skills include: clearly-communicated, human-friendly technical writing; teaching introductory through undergraduate physics, mathematics, signal processing, and computer programming; the scientific Python stack (`NumPy`, `Matplotlib`, `SciPy`); LaTeX, including real-time-speed transcription of handwritten math; vector graphics (Tikz; Inkscape); Bash scripting and the Unix core utilities; working on a `systemd` Linux system; Git and GitHub.

Things I've Made

Real-time LaTeX Using (Neo)Vim *Tutorial series/technical writing*
A 7-article guide to supercharged mathematical typesetting officially endorsed by the VimTeX project.
See it here: https://ejmastnak.github.io/tutorials/vim-latex/intro.html

Solved exercises and lecture notes *Educational writing*
1500+ pages of solved exercises and lecture notes in undergraduate physics, typeset in LaTeX
See it here: https://ejmastnak.github.io/fmf.html

Arch Linux Post-Installation Tutorials *Technical writing*
Bite-sized tutorials for a functional work environment after a minimal install of Arch Linux.
See it here: https://ejmastnak.github.io/notes/arch/about.html

Education

University of Ljubljana, Faculty of Math and Physics *Ljubljana, Slovenia*
Bachelor of Science in Physics *October 2018 to September 2021*
Undergraduate "mini-thesis": "End-to-End Particle Classification in High-Energy Physics"
Thesis webpage: https://ejmastnak.github.io/projects/seminar/seminar.html

Newport Harbor High School *Newport Beach, CA*
International Baccalaureate Diploma *September 2014 to June 2017*

Employment

TMG-BMC Ltd. *Ljubljana, Slovenia*
Programmatic Analysis of Time-Series Biomechanics Data *August 2019 to present*
TMG-BMC is a biomechanics and kinesiology company specializing in high-end, non-invasive sensors for quantifying muscle function in professional athletes. Webpage: https://www.tmg-bodyevolution.com/

- Analysis of 1D biomechanical time-series data from TMG, EMG, load cell, and MC sensors: detecting and quantifying twitch potentiation; quantifying contraction time, maximum muscle displacement, and rate of force development.

  Techniques include numerical integration and differentiation, Lagrange interpolation, curve fitting, iterative methods for nonlinear equations, peak detection, filtering, statistical hypothesis testing, statistical parametric mapping.
- Developed cross-platform user interface (in Java using Swing) to make above-described analysis accessible to non-technical users.
- Trained to use TMG, EMG, load cell, and MC sensors.
- Regularly worked with professional (including Olympic) athletes, mostly in track and field.

University of Ljubljana, Faculty of Math and Physics *Ljubljana, Slovenia*
Textbook Author *June 2021 to December 2021*
Commissioned to transform the Faculty's introductory mechanics course into English-language textbook form, using recorded Slovene video lectures. Project goal: make the university's physics program more approachable to foreign-exchange students.

Employment (continued)

Newport Harbor High School *Newport Beach, CA*
Two positions: *Academic Tutor* and *Soccer Coach* *August 2017 to June 2018*

- Tutor in physics, math and programming for Newport Harbor High School's AVID program, which provides school-sponsored after-school tutoring to students.
- Assistant coach in the boy's soccer program for the academic year (as an alumnus and former varsity captain); head coach of the Frosh-Soph team in the 2017-18 winter season.

Self-Employed *Newport Beach, CA*
Private Tutor in Math and Physics *September 2017 to June 2018*
Worked as a private tutor in math and physics in the Newport Beach and Costa Mesa area; served students from Newport Harbor and Corona del Mar High School.