Fu Wen Tay
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Mobile : -

Education

- **University of Oxford** — Oxford, United Kingdom
  Bachelor of Engineering in Engineering Science; SG:Digital Scholarship — *Oct. 2022 – Jun. 2025*

Experience

- **Zimplistic (Rotimatic)** — Singapore
  Firmware Engineer Intern — *Nov 2021 - Jan 2022*
  - Developed **Unit Test** scripts in **Python** for the heater and wedge press sub-assemblies.
  - Built Outgoing Quality Control (OQC) machines that runs a series of Unit Tests on the different sub-assemblies of the **Rotimatic**[1] to flag any failures, and conducted analysis to diagnose the type of failures.
  - Hacked printers and scanners to integrate them into our OQC machine to streamline the QC process.
- **A*STAR, Bioinformatics Institute** — Singapore
  Electronics Engineer Intern — *Apr 2018 - Dec 2019*
  - Designed and engineered a Smart mattress to alleviate pressure ulcer formation in bed-ridden patients.
  - Smart mattress comprised a cartesian network of our proprietary polymer, force-sensitive resistors, transistors and electromagnets – all controlled by an **Arduino** which maintained a negative feedback loop.
  - Used **Fritzing** to design our prototype before soldering and wiring the components to form our product.
  - Smart mattress patented in 2019 and is undergoing clinical trials at Ang Mo Kio-Thye Hua Kwan Hospital.

Projects

- **Modelling the Paradoxical Downward Oscillatory Motion of a Bubble in an Oscillating Pressure Field**
  - Developed a dynamic numerical model in **Mathematica** to explain the motion of the bubble and derived an analytical solution to further characterise the behaviour of it (sinking criteria, decomposed motion).
  - Force analysis done showed that the isothermal expansions of the bubble coupled with its time-varying upthrust manifested a Bjerknes Force that time-averages to a non-zero value, explaining the sinking motion.
  - Verified through Phase and Trajectory plots that the model holds true as frequency and amplitude of pressure field, and the viscosity of the fluid were varied (experimental data collected via computational pixel tracking).
- **Modelling the Liquid Capillary Bridge between Objects**
  - Developed a quasistatic quantitative model in **Mathematica** of the capillary bridge and characterised its force.
  - Energy considerations with the Euler-Lagrange equation and pressure considerations using the Young-Laplace equation showed convergence in the same second order ODE which described the capillary bridge. Using boundary conditions based off the Young equation, the ODE was solved numerically simulating the bridge.
  - Verified through Force-Displacement plots that the model holds true as viscosity and volume was varied.
- **Modelling the Newton's Cradle with Hertzian and Viscoelastic Considerations**
  - Developed a dynamic quantitative model in **Mathematica** of a dissipative Newton's Cradle.
  - Torque considerations with Hertzian and Viscoelastic losses were used to describe the motion of each bob. Considering the collision condition vectorially, the piecewise function of its torque is split based on collision and is then solved numerically – giving the trajectory of each bob, and as a whole the motion of the Cradle.
  - Verified through Trajectory plots that the model holds true as length of string, angle of release, and number of bobs were varied.

Programming Skills

- **Languages**: Python, SQL
- **Others**: Scikit-learn, Django, Arduino, Mathematica, Unit Testing

[1] Rotimatic is the world's first robotic kitchen appliance. It makes flatbread through dispensing, mixing, flattening and heating raw ingredients.