YOUYOU YANG

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Education

- **Mcgill University** — Montréal, CA
  Bachelor of Science in Physics and Computer Science — *Aug. 2019 – June. 2023*
  - **Relevant Coursework**: Quantum Mechanics, Astrophysics, Mathematical Analysis, Data Science, Machine Learning, Algorithm Design, and etc.

Work Experience

- **BorgWarner Technical center** — Shanghai, CN
  Software Development Intern — *July 2021 - August 2021*
  - **Developed Communication Protocol**: Developed the communication protocol, interface and routing in Geely Lotus automobile controller based on AutoSAR. Utilized Python scripting to generate interface files in **C**, significantly improving the development efficiency.
  - **Led Upper Computer Modularization**: Led the modularization of the upper computer for the "Automatic Express Car" project. Implemented fixed-time and fixed-point transportation with **ROS** package on **Raspberry Pi**. Wrote Linux shell scripts to regularly run Python scripts, sending signals to lower computer to run to specified coordinates on GMapping package-built graph.
- **Dreame Tech** — Suzhou, CN
  Software Testing Intern — *May 2021 - June 2021*
  - **Software Testing and Debugging**: Tested the beta version of the Dreame Z10 Robot Vacuum cleaner, primarily focusing on the robot's firmware and the control features of the Mijia app. Identified and debugged issues by capturing log data with **Bash** scripts. Assisted developers in resolving bugs by performing version management and problem reporting on **Jira**.

Research Experience

- **McGill ATLAS Group** — Montréal, CA
  Undergraduate Researcher — *May 2023 - August 2023*
  - **Research on Digital Filtering Algorithms for ATLAS Liquid Argon Calorimeter**:
    - Supervised by Prof. Brigitte Vachon, Alessandro Ambler.
    - Funded by the Natural Sciences and Engineering Research Council (**NSERC**).
    - Implemented and evaluated multiple **digital filtering** algorithms in Python to identify the most effective solution for energy reconstruction in the ATLAS liquid argon calorimeter.
- **McGill ATLAS Group** — Montréal, CA
  Undergraduate Researcher — *Sep 2022 - Dec 2022*
  - **Setting constrains on Effective Field Theory Lagrangian**:
    - Supervisors: Prof. Brigitte Vachon and John McGowan.
    - Estimate the Lagrangian parameters through maximum likelihood estimation (**MLE**) fitting method. Focused on the Vector boson scattering (VBS) $W\gamma$ reaction data and analyzed the impact of systematic uncertainty on the confidence level.
- **McGill ATLAS Group** — Montréal, CA
  Undergraduate Researcher — *May 2022 - Aug 2022*
  - **Studies of gauge bosons self-interactions in high-energy proton-proton collisions**:
    - Supervisors: Prof. Brigitte Vachon, John McGowan and Xingguo Li.
    - Funded by McGill Science Undergraduate Research Awards (**SURA**s).
    - Analyzed VBS $W\gamma$ reaction data from the frame of Standard Model Effective Field Theory(**SMEFT**) with PyROOT library, to search for the existence of anomalous quartic gauge couplings (aQGC).

Projects

- **May 2023 - July 2023: Developing a Chinese Restaurant Process (CRP) with Gibbs Sampling**:
  Developed a CRP with **Gibbs sampling** to tackle the problem of **infinite Gaussian mixture modeling**. Extended the traditional **CRP** model to accommodate an unbounded number of mixture components, enabling flexible modeling of complex data distributions.
- **Apr 2023: Building an Electrocardiogram (ECG) with Circuit and Arduino**:
  Designed a breadboard circuit including a differential amplifier, notch filter, and low-pass filter to capture ECG waveforms. Utilized the **hardware** to visualized the signal using an oscilloscope and Arduino board.
- **May 2022: Measuring of Lambda Cold Dark Matter parameters with Markov chain Monte Carlo method**:
  Employed the Markov chain Monte Carlo (**MCMC**) method to fit cosmic microwave background (**CMB**) data to the Lambda Cold Dark Matter **ΛCDM** model. Aimed to set constraints on basic density parameters and Hubble's constant.
- **May 2022: Monte Carlo Tree Search for the Colosseum Survival game**:
  Developed an intelligent agent using the **Monte Carlo Tree Search (MCTS)** algorithm for the Colosseum Survival game. Outperformed most random opponents with efficient next-step predictions and minimal memory usage.

Additional Experience:

- **Published Documentation**:
  - **Jul 2022:** J. P. Mc Gowan, Z. Wang, B. P. Honan, *et al.*, "Observation and differential measurement of electroweak production of W(l,nu)gamma + jets," CERN, Geneva, Tech. Rep., 2022. [Online]. Available: https://cds.cern.ch/record/2819968
- **Talks** :
  - **Aug 2022:** Summer Undergraduate Research Showcase, McGill University
    Contributed talk: *Sensitivity studies in the search for Anomalous Quartic Gauge Couplings in proton-proton collisions at the LHC.*
  - **Aug 2022:** ATLAS Canada Summer Student Presentations, CERN
    Contributed talk: *Sensitivity studies in the search for Anomalous Quartic Gauge Couplings in proton-proton collisions at the LHC (same).*
- **Hackathon**:
  - **Jan 2022:** Hack Mcwics 22, McGill Women in Computer Science: Most Practical Award - Developing a website of Serving Size Converter using **HTML+JavaScript**.

Skills

- **Technical Skills**:
  - **Programming:** Proficient in Python (with experience in libraries such as NumPy, SciPy, Pandas, Matplotlib, TensorFlow, Astropy, and Scikit-learn), C, Bash, and SQL. Basic knowledge in HTML, CSS, and JavaScript.
  - **Hardware Design:** Familiar with Arduino and Raspberry Pi.
  - **Tools and OS:** Proficient in using Linux operating system, Git for version control, and LaTeX.
- **Language Skills**:
  - **Mandarin:** Native speaker.
  - **English:** Fluent (IELTS 6.5).
  - **French:** Basic proficiency.