BRIAN FORMENTO

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Nationality: UK passport holder
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Experience

Researcher   08/2019 – 08/2020
IDS, National University of Singapore, Singapore

Research in computer vision for medical imaging.
Built a front end WebUI (A medical software for
hospitals and polyclinics in Singapore).
Developed a business insight tool to analyse the
spending behaviour of 1.5M Singaporeans for **EzLink**.
Supervised by: Prof Wynne Hsu & Prof Mong Lee

Intern - Signal processing   07/2017 – 09/2017
Roke Manor Research, United Kingdom

Working with Matlab, C and Python, for the
implementation of a researched SP algorithm.

Intern - Electronic engineer   07/2016 – 09/2016
L3 ASV, United Kingdom

Designed a PCB, reduced costs by 63% per item.

Projects

PhD Program   08/2020 – present
National University of Singapore, Singapore

Investigating robustness in deep learning and their
limitations against adversarial samples and dataset
shift.

Gait recognition meta-learner   01/2019 – 07/2019
National University of Singapore, Singapore

Used video data and one-shot learning with a recurrent
convolutional neural network in a Siamese formation
for gait recognition research.

Point cloud AI denoiser   07/2018 – 01/2019
Southampton University, United Kingdom

Using ML to remove aliasing and moiré from point
cloud render videos.

Scenery recognition   07/2018 – 01/2019
Southampton University, United Kingdom

15 class scene recognition. Achieved 3rd highest
accuracy in a class of 300 students.

Protein structure predictor   01/2018 – 07/2018
Southampton University, United Kingdom

Secondary protein structure prediction using an LSTM.
Achieved close to state-of-the-art performance.

Education

PhD Candidate – Computer   08/2020 – present
Science – GPA 4.63/5
National University of Singapore, Singapore

Received the Singapore International Student Award
scholarship.
Supervised by: Prof See-Kiong Ng NUS, Dr. Chen
Zhenghua and Dr.. Chuan Sheng Foo A*Star,

MEng (1st Class Hons)   09/2015 – 07/2019
Electronic engineering with AI
Southampton University, United Kingdom

Key Modules: Computer Vision, Evolution of
complexity, Advanced programming, Machine
Learning, Computational Biology.

University's entrepreneurial activities
- Co-organised and co-run 5 speaker events and 2
  workshops throughout the year 16/17.
- Scouted and fast-forwarded through an incubator
  3 teams, one won £25k from 3 investors in 2017.
- Pitched a start-up together with two all-star
  students in 2016
- Pitched another start-up in 2016 and won £3k.

Skills

Computer science
NLP, Transformers, TextAttack, Numpy, Scikit-learn,
Pandas, Keras, Pytorch, Matplotlib, Anaconda, Git,
Docker, Linear algebra, Deep learning, Computer
Vision, OpenCV, Machine learning, HTML, ReactJS,
C, C++.

Languages
English & Italian   Native

Hackathons

Attended 10, Finalist in 3.

F10 hackathon   15/09/2019
PWC headquarters, Singapore

Developed with a team an AI tool to aid corporate
action decision making. It uses stock exchange data
and random forest decision trees.

Yitu online hackathon   20/02/2019
Singapore

Object detection task on pedestrian/cars, my model
achieved the 10th highest accuracy in the whole of
Singapore, **won $300.**

Publications

1. **Brian Formento,** Wenjie Feng, Chuan Sheng Foo, Luu Anh Tuan, See-Kiong Ng. SemRoDe: Macro Adversarial Training to Learn Representations That are Robust to Word-Level Attacks. **Description**: Applying distribution matching with MMD, CORAL, or optimal transport (SinkHorn) to BERT to align the base and adversarial distributions in the feature space to learn robust representations. **(NAACL 2024 Main Track)**

2. **Brian Formento**, Chuan Sheng Foo, Luu Anh Tuan, See-Kiong Ng. Using Punctuation as an Adversarial Attack on Deep Learning Based NLP Systems: An Empirical Study, European Chapter of the Association for Computational Linguistics. **Description:** A paper investigating the use of punctuation as an attack vector in deep learning NLP systems. (**EACL 2023 Findings**)

3. **Brian Formento**, See-Kiong Ng, Chuan Sheng Foo. Special symbol attacks on NLP, IEEE International Joint Conference on Neural Networks, **Description:** An algorithm to discover and exploit special symbols in NLP frameworks such as BERT. (**IJCNN 2021 Oral**)

Community Service

1. **Teaching Assistant (2023):** I spent a semester creating and marking assignments for the Text Mining CS5246 module.

2. **NUS MComp Application Reviewing (2022):** Reviewed 30 applications to the school of computer science for admission purposes.

3. **Mentoring Undergrads (2022):** Built a statistical data cleaning pipeline based on the ActiveClean model with four undergrad students.
Video: http://y2u.be/A69TggS9r0k

4. **Supervising Undergrads (2022/2023):** I sourced and employed two undergrads under the institute of data science (IDS) at NUS, which I was supervising while they worked part-time. We were building a customer feedback classifier and summarizer for Changi Airport Group (CAG).

5. **Stack Overflow:** Reached over 100k people through my questions and answers with a reputation of ~720.
https://stackoverflow.com/users/6423473/brian-formento