Shardul Sapkota

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Education

May 2020 **Yale-NUS College**, Singapore GPA: 4.81/5.00
B.S. in Mathematical, Computational and Statistical Sciences, *Magna Cum Laude*
Software Engineering Tutor (2019-2020)
Summer Coursework in Engineering, **Yale University**, New Haven, USA (2017)

Dec 2018 **Massachusetts Institute of Technology**, Cambridge, USA GPA: 5.00/5.00
Coursework in the Department of Electrical Engineering and Computer Science and MIT Media Lab (Exchange Semester)

Research Experience

Sept 2019-Present **NUS-HCI Lab**, National University of Singapore, Singapore
PI: Shengdong Zhao

- Designed and implemented machine learning models to classify changes in people's attentional states in real-time with an accuracy of up to 81% from physiological data. *(Zhang et al. 2021)*
- Designed experiments with a novel psychophysics attention task and applied signal processing (non-linear metrics and frequency analysis) on EEG, skin conductance, and heart rate data of 10 participants. *(Zhang et al. 2021)*
- Developed apps for smart glasses and wrote a first author paper quantifying the intrusiveness of four wearable input techniques for smart glasses. *(Sapkota et al. 2021)*

May-Aug 2019 **Augmented Human Lab,** University of Auckland, New Zealand
PI: Suranga Nanayakkara

- Developed a conversational agent (iOS app) that uses heart rate and skin conductance signals to provide context-aware memory training for prospective memory lapses. *(Chan et al. 2020)*
- Built an interface for cognitive load detection using an eye-tracker and a CNN classifier. *(Kaluarachchi et al. 2021)*
- Programmed a display driver for an OLED display in a smart-watch designed for those with hearing impairments.

Sept-Dec 2018 **Fluid Interfaces Group**, MIT Media Lab, Cambridge, USA
PI: Pattie Maes

- Built a mobile teeth gesture recognition system to collect data to model hands-free interaction for wearable computing. *(Vega et al. 2019)*
- Applied machine learning models to classify four different teeth gestures with accelerometer and gyroscope data with personalized accuracy rates of up to 100%. *(Vega et al. 2019)*

Work Experience

Aug 2020-Present **Shopee,** Singapore
Machine Learning Engineer

- Developed deep learning and statistical models to update users' recommendation pool in real-time, providing recommendations personalized to user behavior.
- Improved the recommendation click-through-rate by 3.4% and click-through-conversion-rate by 10% in the product detail page.

Publications

Sapkota, S.*, Ram, A.*, Zhao, S., 2021. *Ubiquitous Interactions for Heads-Up Computing: Understanding Users' Preferences for Subtle Interaction Techniques in Everyday Settings.* In ***23rd International Conference on Mobile Human-Computer Interaction (MobileHCI'21)***

Kaluarachchi, T., **Sapkota, S.**, Taradel, J., Thevenon, M.A., Matthies, D.J.C., Nanayakkara, S., 2021. *EyeKnowYou: Detecting Increased Cognitive Load and Actual Screen Time using a DIY Head-Mounted Webcam.* In ***Extended Abstracts of the 23rd International Conference on Mobile Human-Computer Interaction (MobileHCI'21)***

Zhang, S.*, Yan, Z.*, **Sapkota, S.**, Zhao, S. and Ooi, W.T., 2021. Moment-to-Moment Continuous Attention Fluctuation Monitoring through Consumer-Grade EEG Device. ***Sensors, 21***(10), p.3419.

Chan, S.W., **Sapkota, S.**, Mathews, R., Zhang, H. and Nanayakkara, S., 2020. Prompto: Investigating Receptivity to Prompts Based on Cognitive Load from Memory Training Conversational Agent. ***Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 4***(4), pp.1-23.

Vega Gálvez, T., **Sapkota, S.**, Dancu, A. and Maes, P., 2019, May. Byte. *it: discreet teeth gestures for mobile device interaction.* In ***Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*** (pp. 1-6).

** Denotes equal contribution.*

Projects

2019 **DiaryRack:** Applied constrained optimization with integer programming to automate meeting scheduling in calendars as part of an independent research project.

2018 **Yale-NUS Laundry Viewer:** Led a team of 3 students to design, prototype, and develop a platform providing real-time monitoring of laundry machine status using LED sensors.

2018 **StandRight**: Programmed force sensitive resistors and a servo motor attached to a shoe to tighten shoelaces during unequal weight distribution for those who have leg injuries.

Honors and Awards

2020 Singapore-HCI Paperthon *Most Promising Paper* Award (for Sapkota et al.)
2019 Yale-NUS Student-Initiated Summer Research Fund (S$5750)
2018 JY Pillay Global-Asia Programme Summer Internship Award (S$1187)
2016 Outstanding Cambridge Learner – Top in the World in Mathematics, AS Level.

Technical Skills

Proficient in **Python**, **Golang,** and **LaTeX**. Experience in **Java**, **Swift**, **JavaScript**, **C**, **HTML**, **CSS**, **MATLAB**, **R**, and **OCaml**.