STATEMENT OF INTEREST

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Brain Signal Analysis: A Computational Neuroscience of Wellbeing

His Holiness the 14th Dalai Lama of Tibet has repeatedly advised us that we need to focus on the "hygiene of emotions". Our brain or mind is the hub of our emotions and it is the chief executive organ of our body that regulates the wellbeing of both the mind and the body. My interest in the field of brain studies unfolds in two phases. One, accepting the importance of the "hygiene of emotion"; two, participating in the characterization of the effects of the good and the bad emotions scientifically.

The importance of "hygiene of emotion"

The Dalai Lama has inspired many around the world to focus on the "hygiene of emotions". In the west, in-spite the excellent system of education, the lives seem to be driven mostly by profit margins and the financial gains which has little to do with the "hygiene of emotions". In the Eastern cultures like that of the Tibetan's, understanding the benefits of "kindness" or "compassion" is a key in the individual's live as well as the society as a whole. On top, practicing how to be kind is a necessity. Meditation could be a useful technique to promote kindness. According to the Dalai Lama incorporating the "hygiene of emotion" as an academic subject can enhance the wellbeing of all although he warned may take a while to see the effects.

Meditation

Many in the east claim meditation is beneficial. We believe it has many positive effects. Somehow, meditation has not made it into the mainstream lifestyles. We see people stretching, jogging and running everywhere around but not much who are meditating. Is it because there is not enough scientific evidence? Scientific papers have shown positive correlation of higher gamma brain oscillation [1], higher positive valency [2] and neuroplasticity [3] due to meditation, yet only few meditate. The question is how to convince the status quo that meditation works. At least it is clear we need to work harder and smarter.

Brain Signal Analysis (BSA)

During my master's degree, my project is the application of Artificial Intelligence (AI) in brain signal analysis. The choice was clear for me between BSA and Blockchain when presented. The project covers topics on EEG, fMRI, forward inferencing and reverse inferencing on a meditation dataset. Machine Learning (ML) models like General Linear Model (GLM) and Support Vector Machines (SVM) are employed to characterize and classify respectively on brain activities. Brain Signal Analysis with ML is relatively a new approach and has high hopes in its application. If the workings of the meditation can be characterised better and clearer with the help AI, we can continually convince its application in the non-pharmacological clinical treatments.

In summary I have high a passion is characterization of the brain activities due to meditation. Culturally growing up as a Buddhist, it would be an ultimate goal to work on consciousness. My other passion is to work on Thukdam, which is the meditative state of mind when a person passes away.

With my decent grade of A-average in my master's in computer science degree specializing in Artificial Intelligence from Lakehead University, Canada, I have high confidence in making a tangible contribution to the scientific community. With clear motivation from my spiritual leader and the belief in the power of meditation, I am poised to gaze at the various challenges lay ahead of me and determined to make a small progress every year. May the blessing of the Dalai Lama, my teachers, my parents will guide me through these trials and turbulence ahead of my journey. I dedicate all my efforts for the benefit of the whole sentient beings.

Sincerely,
Tenzin Nyima

References:

[1] Lutz, A., Greischar, L., Rawlings, N., Ricard, M., Davidson, R. (2004). Long-term meditators self-induce high-amplitude gamma synchrony during mental practice. Proceedings of the National Academy of Sciences - PNAS, 101(46), 16369–16373.

[2] Chau, Bolton K. H ; Keuper, Kati ; Lo, Mandy ; So, Kwok-Fai ; Chan, Chetwyn C. H ; Lee, Tatia M. C
Brain and neuroscience advances, 2018-05-08, Vol.2

[3] R. J. Davidson and A. Lutz, “Buddha’s brain: neuroplasticity and meditation,” IEEE Signal Processing Magazine, vol. 25, no. 1, pp. 174–176, 2007.