Critique 7 | Week 9 | Disha Singh

The two papers are very similar and very different at the same time. Both being published in the same year but yet seem like addressing a similar problem of detecting heart rate or other health vitals in a very different way.

The paper using iPPG has high level of detailing provided for the data collection and the photographs provided to understand the setup better.

However, this kind of a way to collect data has its own disadvantages. So specific is the places of collecting reflected light's parameters, that it has to be from the top of the head to the shoulders. I thought of various kinds of applications for this work but to me in most cases it is not necessary that sunlight is present for this technology to work. For e.g., being able to find alive people under a rubble using heartbeat detection of such kind would be very useful but where will we get the sunlight from under the rubble ? We can apply similar study to animals in a forest to detect populations in forests, their health and safety (as in sanctuaries) but then again the issue of not enough sunlight comes in. Similarly, why was the data collected only at midday time in June, if this study goes for further research, we can never be sure how that works in winter season when the sun rays are way weaker. Also, don't most people measure their heart beats at dusk/dawn when they exercise? The study can tell whether or not sunlight is effective over the previous studies conducted indoors - at least when the sunlight is available the maximum - but we cannot rely on it for future studies yet as it has major fallbacks due to its dependency on intense sunlight thus having a very niche use case.

Something good about the data is that it is evenly divided between men and women but they all lie in the age range 19-47. That makes me wonder what about kids and elderly? They are the major populations which will have difficulty getting heart rate measured by usual contact methods and if they are not considered in this study (especially because they have very different blood pressures than usual adult population) then this study in my opinion is incomplete with the true beneficiary segment of this research ignored.

Another question I want to discuss in the class is why was SPF given to the people and where is the data for people without SPF? Because it is highly possible that the results obtained without SPF will be worse as SPF can be responsible for reflecting more light from the person's face.

The second paper with RADAR sensing is in my opinion stronger in foundation and works even in ambient lighting. This one is contradictory to previous one in the sense that this one works unobtrusively while the previous one is very intentional and makes the user sit in a particular way, a direction, even wearing SPFs.

Also, this RADAR sensing technology is specifically being thought about keeping old people in mind whereas the iPPG paper excludes the elderly population completely as they collect data only for ages 19-47 years old. What's more is that RADAR is extremely more precise in monitoring health conditions than what is apparent in the iPPG paper and is more unsupervised, keeping less dependence on the data collected for fall detection and ADLs.

I particularly like the various uses of the contactless sensing tech mentioned in the RADAR paper, and also takes care of compensating for other people nearby without much loss of accuracy.