

Sociotechnical Synthesis

One example of technologies which can lead to mental health decline are mobile computer systems such as smartphones and portable video game consoles. Critics allege that the increasing prevalence of these computing systems is leading to societal mental health collapse. Both my technical and STS research involve this topic of mobile computing and mental health. For my technical research, my capstone team and I engineered a low-power embedded computer system which allows a user to play the famous arcade game, Tetris. It is important to discuss, however, the ethical (STS) implications of creating addictive games and software on embedded computers which is where my STS research comes in. My STS research is on the effect of smartphones, mobile gaming platforms, and quarantine on mental health. My personal experiences with smartphone addiction as well as my interest in embedded computer design spurred my motivation to pursue these research topics.

As mentioned before, in my technical research my capstone group and I created a low-power embedded computer (computer with limited resources) capable of running the game, Tetris as part of the UVA Electrical and Computer Engineering capstone course. The computer system consisted of a low-power microcontroller (processor, extra logic, and IO integrated on a single chip), an LED matrix to serve as the screen, and a button array to serve as the controller. The software and hardware were specially designed to improve power-efficiency and, so, improve battery life. This is similar to how engineers are designing smartphones, and portable video game systems in industry in order to allow users to spend more time on these devices (time period between recharging the computer).

My STS research discusses the implications of mass-producing addictive electronics such as the embedded Tetris gaming console. The research provides a holistic view of the effects of mobile computing on mental health. In the first section of this research, I review relevant literature in the field concerning the relationship between smartphones, mobile video games, and the mental health of users. In the second section, I discuss the results of a poll conducted for this research which involved polling 12 individuals on their experience with mental health and mobile electronic usage during COVID-19 quarantine. I concluded from my research that smartphones lead to mental health decline and that engineers should be wary of creating smartphones which are more energy-efficient as this would only increase the interactions between the device and user. However, there is far less evidence that mobile games lead to mental health decline and some evidence, even, that mobile games can be created to reduce the symptoms of mental health conditions. My conclusions from the polling data are that quarantine has affected the relationships of individuals' mental health with their mobile electronic usage to differing degrees. That being said, more research should be done in this area with a larger group to poll.

Both of these projects allow for a better understanding of the intricacies of creating a mobile computing system as well as the ethical implications of selling these systems into individuals' lives. I learned just how simple it is to create an addictive gaming platform and how the relationship between mental health and mobile electronics use is a highly nuanced one and can depend on the individual in question. Understanding the relation between mobile computers and mental health will allow engineers to make more ethical decisions as per the social construction of technology theory on design decisions.