Broadcasting Beyond: Making the Next Generation in Communication

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Abstract

Broadcasting requires a large setup in order to function well. It is very important for the reader to look directly into the camera while reading the teleprompter. Looking at the camera is vital so that the viewer sees the reader looking directly at them. Current equipment is large, bulky, expensive, and hard to move around. With everything getting smaller yet more powerful, why have broadcasting systems remained so big and tedious? The first step to solving this problem is to look at the camera. Cameras in portable devices today are powerful enough to match larger cameras. A much smaller camera taken from a smartphone could be powerful enough to get a clear recording of someone reading from a teleprompter. Modern smartphone cameras can record video in 4K with 60 frames per second. That amount of quality should be enough to broadcast at a high standard. The next biggest problem would be the monitor. Current Teleprompters have a screen placed horizontally with a slanted mirror on top to reflect what's on the monitor. This is not space efficient. In order to solve this problem, the camera could be placed behind the monitor. No mirrors would be involved, and the monitor would be upright. There are some ideas as to how to get the camera to see through the screen. The first idea was to put a small hole through the liquid crystal display of the monitor, so that the small phone camera can see through. This caused problems because any hole through the display would cause the liquid crystals to leak and cause bleeding on the monitor. Another proposed idea was to use a transparent display. That idea could work with 100 percent transparency, but that rarely is the case. The slight dim on the screen would be visible to the camera, and the quality of the video would suffer. The third idea was to split the screen into four displays, with the camera in the center of them. The issue with this was cost efficiency, since it requires 4 separate monitors. Another important part of this project is setting up the perfect system. The system that is required is one with a motherboard that is powerful enough to record and stream the video as well as have enough inputs and outputs to work with all the equipment. A unique feature of the system is to include a SIM card reader, so that there can be cellular data connection. The idea is to bond the wired connection of the system and the cellular data connection together in order to stream the video without sacrificing quality. In order to follow the mission to make a smaller system, the hardware will utilize a motherboard that is much smaller than a regular desktop motherboard. Many of the potential boards were dedicated for mobile devices or embedded systems, and thus, are a good size for this project.

Keywords
Broadcasting, Eye-contact, Remote, teleprompter, technology

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Biography

Aaron Lindlbauer is an undergraduate student attending Lawrence Technological University. He is working towards his bachelor's degree in embedded software engineering, and plans on graduating in the year 2021. He is just getting started into research and this is the first research project he has done.

Dr. George P. Pappas is an Assistant Professor of Electrical and Computer Engineering at Lawrence Technological University, Southfield, MI, USA. He has also taught Biomedical Engineering courses in biomedical devices and imaging processing. He has over 10 years of teaching and research experience in embedded systems. He has been the PI for a resent DENSO grant in machine vision safety system in vehicles. He is with the Electrical and Computer Engineering Department since 2016. He received his masters and Ph.D. from Oakland University, Rochester MI, USA. He has taught and mentored students in the areas of embedded systems, encryption and security, imaging processing in medical and automotive applications, microcontrollers, and High-Performance Computing systems, artificial intelligent and machine learning algorithms.