The field of embedded hardware and software encompasses microcontrollers, ASICs (Application Specific Integrated Chip), and FPGAs (Field Programmable Gate Arrays), and the firmware and software that runs on the hardware. The field of embedded hardware and software in the Pacific Northwest has both helped accelerate globalization, and has its foundations in globalizing events. Starting with roots in the great depression and the new deal, the Pacific Northwest went through a high tech revolution during World War II due to natural resources like the Columbia dam. After World War II, the environment was perfect for major companies like Tektronix to begin growing the Silicone Forrest. Today the landscape is dotted with titans of industry such as Intel, Microsoft, and Apple. The technology developed in such companies has revolutionized the world, especially in terms of communication as the number of active cell phone subscriptions is nearing the number of people on Earth.

To examine the way the field of embedded computing and microcontrollers has been shaped by globalization, one must first define globalization. According to Sholte there are five typical possibilities when defining globalization, Internationalization or the exchanges between countries, Liberalization or the liberties that people enjoy, Universalization or making everything in the world the same regardless of location, Westernization or making everything in the world similar to the western states, or Schulte’s personal choice of Transplanetary or describing globalization in terms of the connections between people. If we talk about things in terms of Internationalization, the microcontroller industry has spanned multiple countries for their supply lines and production chains to produce final products. If we talk about things in terms of Liberalization, the microcontroller industry has varying fair use policies but all open source hardware and software is free for anyone in the world to use. If we talk about things in terms of Universalization, the microcontroller has been key in producing products that everyone wants globally like cell phones and tablets, creating a shared usage experience. If we talk about things in terms of Westernization, the west began the major technological and production revolutions that allowed for the microcontroller industry to develop. If we talk about things in terms of Transplanetary connections, the microcontroller industry is a key player in bringing near instant communication methods to every corner of the world. Scholte prefers the definition of globalization in terms of Transplanetary connections which plays well with the role microcontrollers have played in increasing Transplanetary connections.

The field of computing and microcontrollers in the Pacific Northwest has a long and complicated history with its roots firmly embedded in the development of globalization. Starting back in the great depression, FDR allocated federal funds for several 3 letter organizations as a stimulus plan. The 3 major groups that impacted the Pacific Northwest were the AAA (Agricultural Adjustment Administration), WPA (Works Progress Administration), and CCC (Civilian Conservation Core). The CCC brought over a half million workers jobs in all 50 states and some territories, working on outdoor, recreation, and construction projects. In Oregon this lead to many public parks and national forests being built and forests being planted for later agricultural purposes. The WPA took many people off unemployment and gave them jobs building roads, bridges, and dams, such as the Columbia Dam and other infrastructure projects in the Pacific Northwest [1]. The AAA kept farming alive and increased topsoil quality throughout the United States by giving farmers money to produce certain crops and not to produce others, thereby increasing demand for certain products. [2] These three groups increased economic production and infrastructure throughout the Pacific Northwest, paving the way for the boom in production that followed.

As World War II begins the United States keeps a policy of non-intervention and they are left out of the war until December 7th 1941 when the Japanese bombed Pearl Harbor. This single event unified the county against a common enemy and sparked production in three major areas, boats, airplanes, and nuclear power. Boeing in Seattle quickly went through a transformation, quickly growing to become 70% of all revenue in Seattle. By the end of the war they were producing a plane every day. Similarly in Portland, Kaiser went through a transformation to employ over 100,000 people by the end of the war. Their production grew until they were able to build a boat every 5 days, producing more ships than anywhere else in the United States. Hanford Washington also grew at a great rate, refining nuclear material for the government’s various nuclear programs. Nowhere near as many people ended up in Hanford as they did in Seattle or Portland as the nuclear refinement program was highly classified and the workers were screened much more carefully. All three locations were picked due to their proximity to the Columbia Dam, which serviced most of their electrical needs. The combination of population, power, and relevant businesses rocketed the growth of the Pacific Northwest forward into the cutting edge of technology and production.

When World War II ended, the United States was left in a strange and unique position. Instead of the world returning immediately to peace, tensions between the United States and the USSR grew into a cold war of technological competition and nuclear proliferation. The usual pattern of peacetime after war is for economies to experience a lull as the need for wartime goods expires and the job market must change to other industries. In this case, the fear of global nuclear war did not let either group fall into a major lull. Instead, the respective governments poured money into creating enough nuclear weapons so that the other side would be afraid to use theirs, and a variety of other technologies that might somehow give them the upper hand. Maybe the most famous example of this technological arms race is the space race where both governments raced first to get a man into outer space, then to get a man to the moon. The necessitation of new methods required to achieve such ambitious goals created a boom in technology development, especially in electrical technologies.

To engineer electrical technologies, the most useful piece of technology is the oscilloscope, a device that allows one to accurately measure electrical signals. When World War II ended, a large amount of technically able men left military service and went into business for themselves doing work in various technical fields. The most famous business to begin under these circumstances was Tektronix, a business started by 4 veterans and the very first producer of a good oscilloscope available to the public. This development revolutionized the field of consumer and professional electronics as electricity was now relatively easy and cheap to measure. Tektronix equipment was used to develop many different technologies, such as an instant communication method desired for the US fire watch. The knowledge the veterans gained working on high technologies during war time allows for many different fields to become public, such as encrypted radio, sonar, and microwaves. In addition, there were scopes developed specifically to clean up video signals used for TV, making video quality in many sectors improve significantly. These improvements to the fields of electronics and communications equipment spurred the field of communication devices in both price and availability, allowing for an ever greater number of transplannetary connections.

In these modern times, the tools of communication are the internet and the cell phone. The price of cell phones and the availability of cell networks encompassing most of the globe has radically changed our methods of communication. Most of these cell networks allow for voice communication, with a smaller subset offering internet communications as well. The number of active cell phone subscriptions in the world reached 6.8 billion in 2013, meaning there were about 96 cell phone subscriptions per every 100 people [3]. This explosion of devices allows people in almost every disparate region of the world to communicate with each other and with people in other regions of the world, although fees may prohibit free and unabated use. Every single one of these cell phones is run by a microcontroller or ASIC device, meaning it would not be possible to achieve so much without the reductions in price and increase in availability microcontrollers afford.