Abstract for Independent Design

Operational amplifiers (op amps) can be configured in a way that allows them to sum up inputted signals over time resulting in an integration function. With the use of op amps configured as integrators, it is possible to create an analog computer. Analog computers can be used for a variety of purposes by representing “constants and variables with proportional analog voltage levels. These were then processed by various electronic circuits that performed the mathematical operations in analog form” [1]. By designing a circuit with the use of integrators and a control system with a controllable voltage input, it is possible to simulate games with analog computers. In the 1975 November/December issue of *Elementary Electronics*, an example of this is seen in the article “Project Spaceflight” [2]. This project focused on building a circuit to simulate launching and docking a spaceship. Similarly, it is possible to create other games that are possible to run on an analog computer. Amplified Racing will be a car driving game simulated on an analog computer where you have to avoid slippery spots on an icy road. It will feature a road course created with the use of an integrator circuit that meanders through fields of green circuity. With the use of variable voltage inputs (controlled by potentiometers), a driver can attempt to stay on the generated course. A comparator circuit will be used to analyze the generated and driven course and will create signals to warn if the driver is going to crash. The game is won if the driver can stay on the course for a given amount of time and is lost if the driver veers off of the road and crashes.

References

[1] L. Frenzel, “Analog Computers,” *Electronic Design*, 22-Jan-2007. [Online]. Available: https://www.electronicdesign.com/technologies/analog/article/21770561/analog-computers. [Accessed: 25-Mar-2020].

[2] M. K. Smith, “Project Spaceflight,” *Elementary Electronics*, pp. 41–46, 1975.