

VOXEL

the world's first true 3D portable holographic volumetric display

Abstract

Voxel is a portable device which can display any digitally modeled 3D objects in real-life true volumetric 3D, similar to the holograms in sci-fi movies.

To achieve this, Voxel solves a wide variety of engineering problems in topics such as rotating electromechanical systems, light map conversion, high RPM high accuracy motor control, optical polarization, LED refresh control circuits, high-speed FPGA interfacing and many more.

How it Works

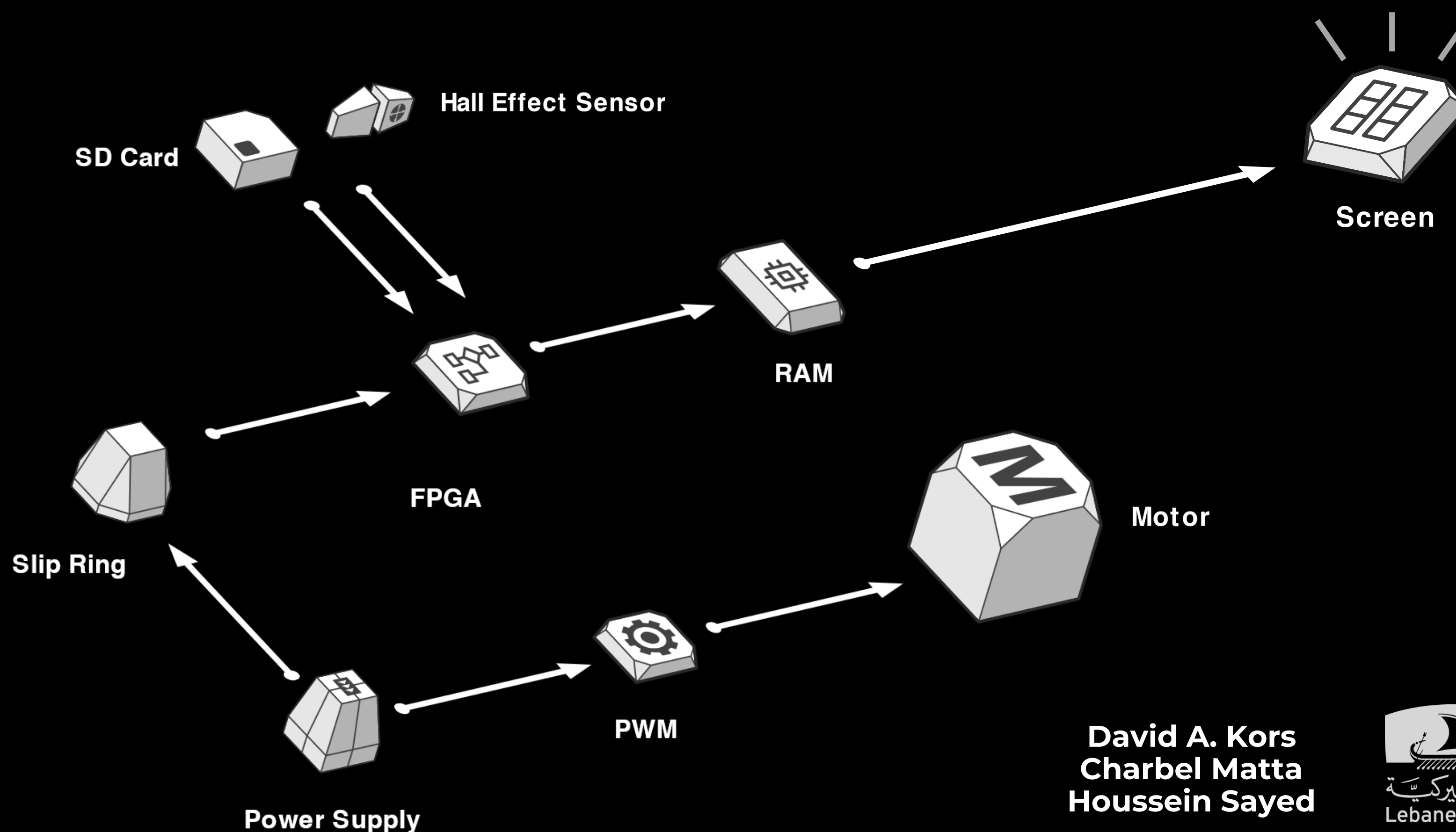
Voxel achieves the full holographic effect by accurately powering and spinning a tilted LED screen at around 1800RPM, synchronizing with it, and controlling it to display a different image to each eye at every angle in order to achieve a real 3D effect.

The entire processing sequence of getting the next image, rotating the screen, calibrating the calculations and displaying the correct output happens in less than 60 micro seconds!

For reference, your eyes take 350,000 micro seconds to blink!



High-level Diagram



David A. Kors
Charbel Matta
Houssein Sayed



Supervised by:
Dr. Dani Tannir