PYNQ-Light-Cube

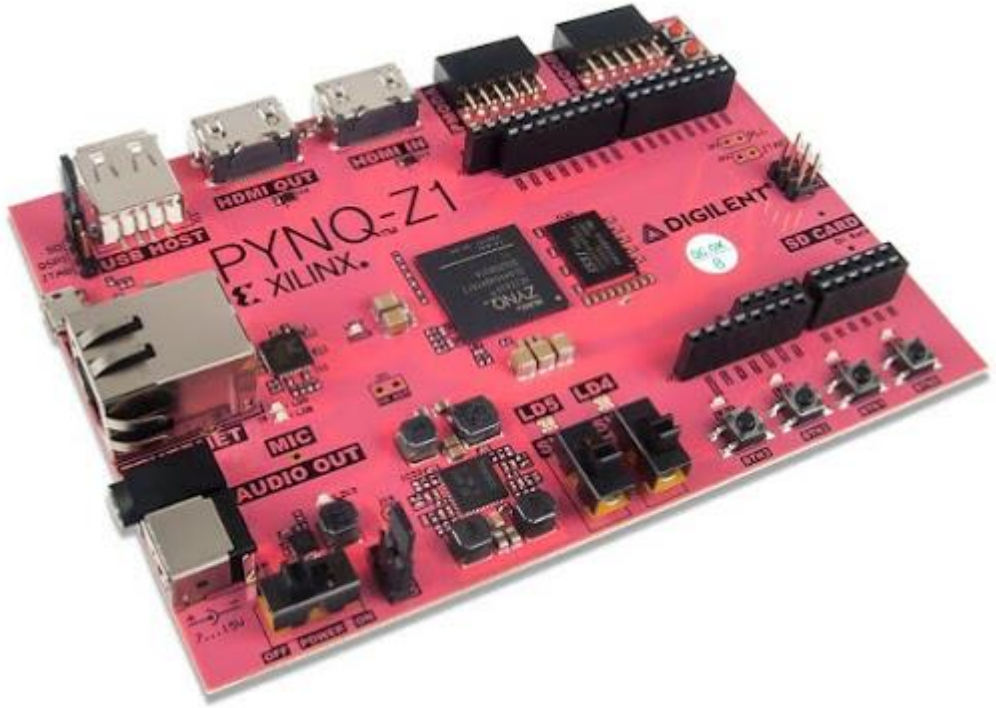
https://www.github.com/sonnyhcl/pynq-light-cube

What's PYNQ

- PYNQ is an open-source project from Xilinx® that makes it easy to design embedded systems with Xilinx Zynq® All Programmable Systems on Chips (APSoCs).
- Using the Python language and libraries, designers can exploit the benefits of programmable logic and microprocessors in Zynq to build more capable and exciting embedded systems.
- PYNQ users can now create high performance embedded applications with
  - parallel hardware execution
  - high frame-rate video processing
  - hardware accelerated algorithms
  - real-time signal processing
  - high bandwidth IO
  - low latency control
  - The PYNQ-Z1 is the first Zynq board to support PYNQ.

Who is PYNQ for

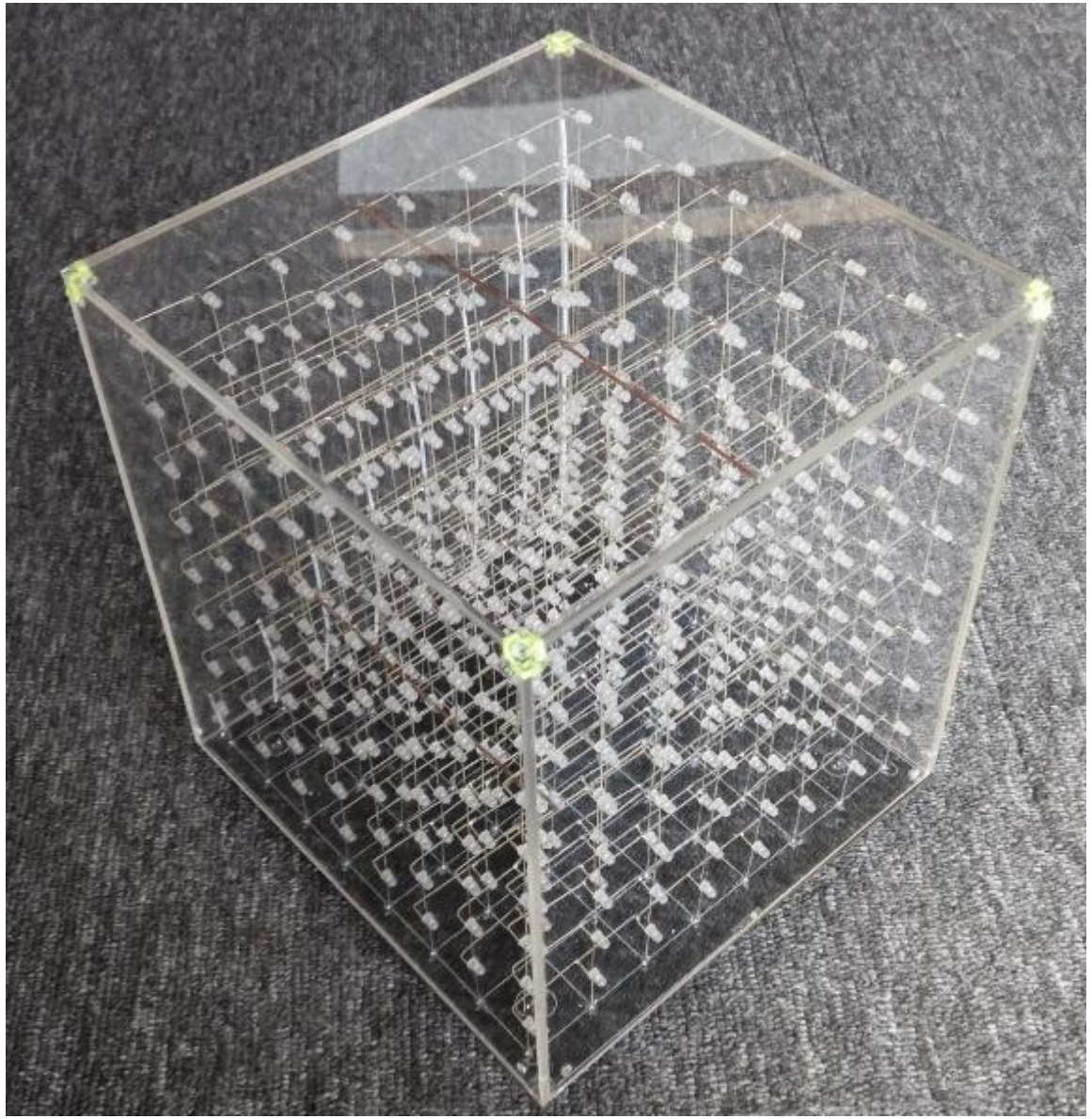
- PYNQ is intended to be used by a wide range of designers and developers including:
  - Software developers who want to take advantage of the capabilities of Zynq and programmable hardware without having to use ASIC-style design tools to design hardware.
  - System architects who want an easy software interface and framework for their Zynq design.
  - Hardware designers who want their designs to be used by the widest possible audience.



More information in:
pynq.io
github.com/Xilinx/PYNQ/
pynq.readthedocs.io/en/latest/getting_started.html

Light Cube

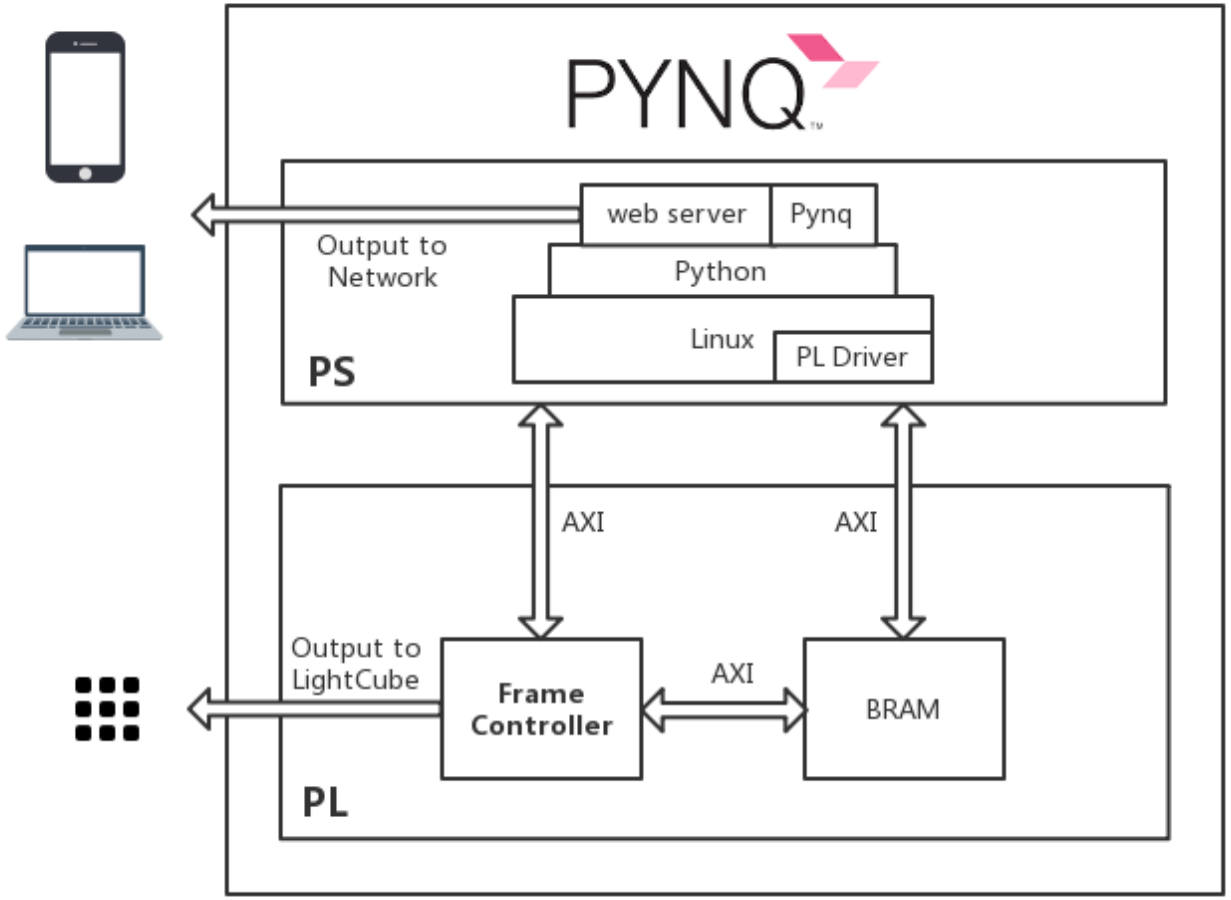
- Including 8*8*8=512 LEDs.
- Scan one line (8 LEDs) one time, which means 64 scans for one shot.
- At least 24Hz to make human eye fell it as a vivid 3D video show. (Visual staying phenomenon)
- Easy to scale up to 16*16*16 or 32*32*32.



You can buy one in www.ebay.com or www.Taobao.com

Light Cube using PYNQ

- Continuous scanning by Frame Controller in FPGA
- 8*8*8(512 bits) LED matrix stored in BRAM in FPGA
- Python program to generate LED matrix data in PS and transfer data to BRAM using PL driver.
- Using browser to edit python program and show real-time LightCube on-off through web server



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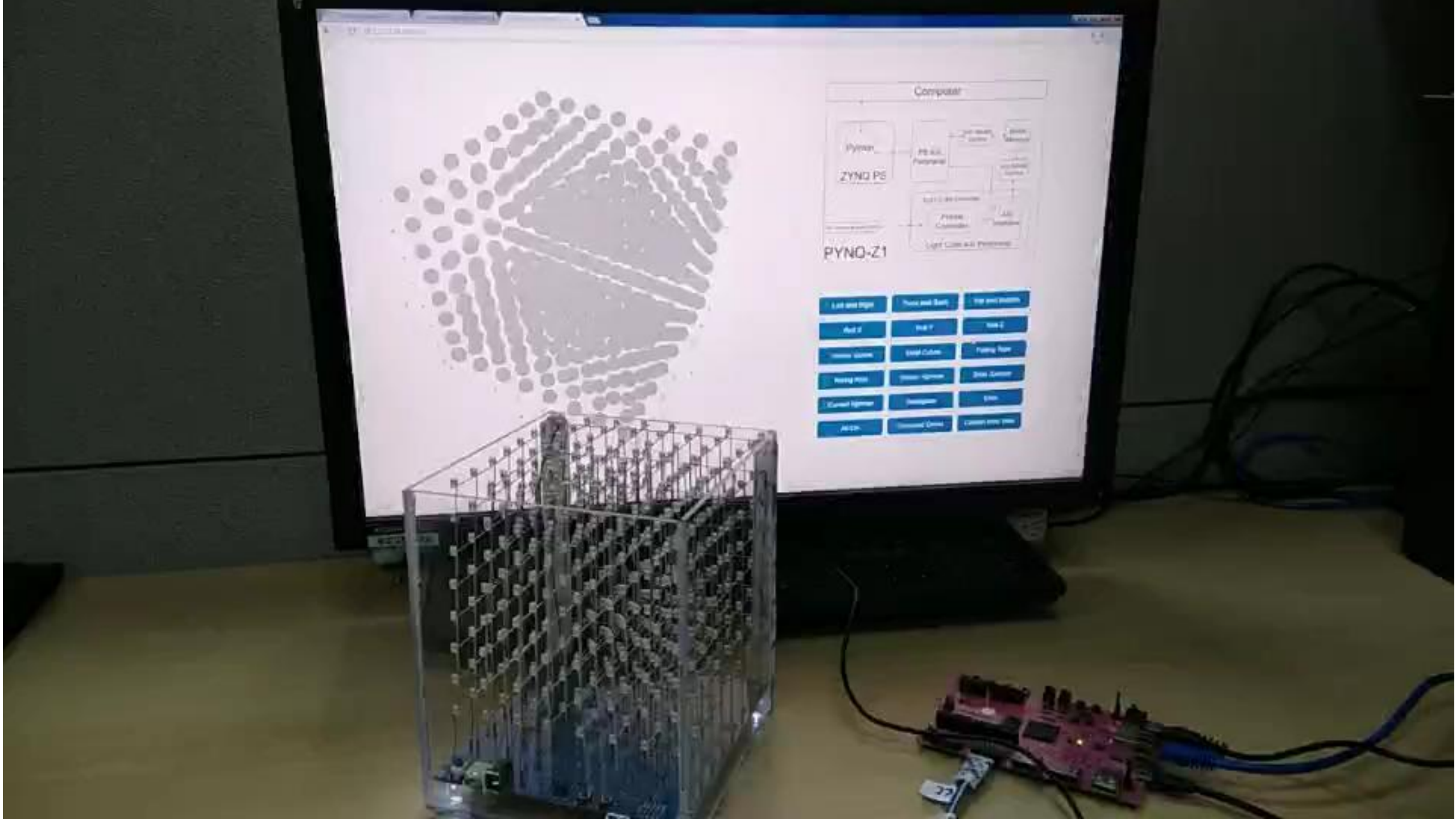
Demo


Compiler
Pynq
ZYNQ PS
PYNQ-Z1

Thank you

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