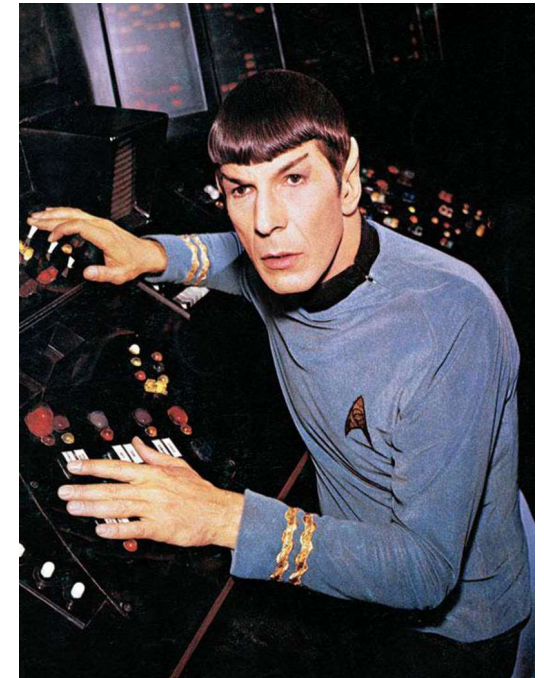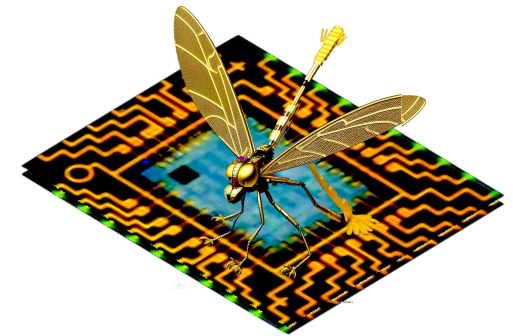# How to Build Star Trek Computer

- Build a English like language using Forth (Forth 2.0?)

- Support is Speech Recognition

- Interface with online AI Engines (API)

- Support Infix Notation

- Intelligent Mobile Robot Controller

- Emulate the Human Brain

- Support Local AI Datasets

- Inference Engine & AI
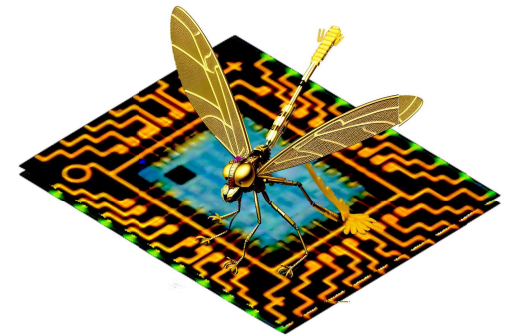

Courtesy Paramount

Getting the Word Out

- Online AI in IOT Conference Keynote Speaker
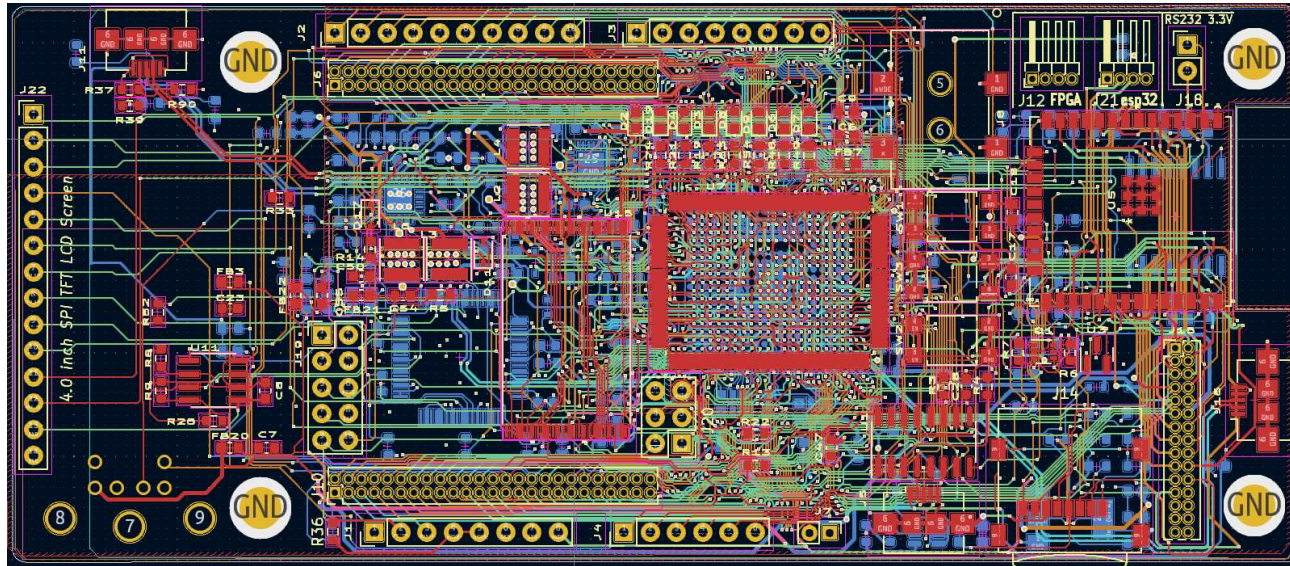

- Interview with Spencer Krause

- https://www.youtube.com/@CWSK

- AI & Robotics Facebook: 376 members

- https://www.facebook.com/groups/1304548976637542/

- AI & Robotics LinkedIn: 3299 members:

- https://www.linkedin.com/groups/12858138/

Current CORE I Project Status

- Current Board requires a Re-spin

- Power Chips Regulating Properly: 1.1V, 1.8V, 2.5V, 3.3V

- Serial Chips not working – osc not working

Lattice LFE5UM5G-85KLUT FPGA Dev Board

CORE I AI Playground Features

5x2.1 inches
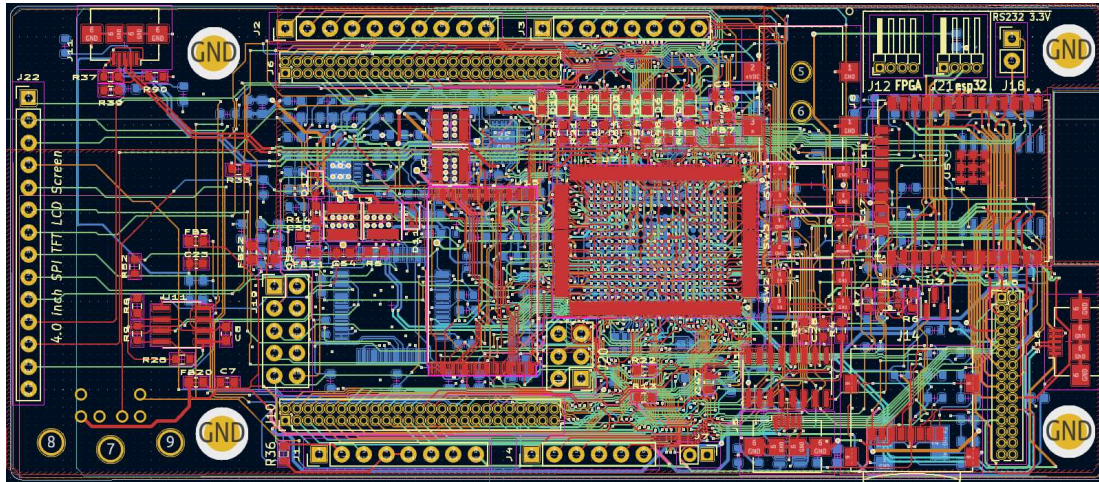

$149

- 25KLUT Standard version, Pro version: 85KLUTs
- 64K x 36 bit 3 ns High Speed SRAM
- 4G bit Flash 512Mx8 45 ns Parallel Flash
- SD CARD
- 4 Inch Display with PS2 Keyboard
- Arduino Hat Connectors

Lattice LFE5UM5G 85KLUT FPGA Dev Board
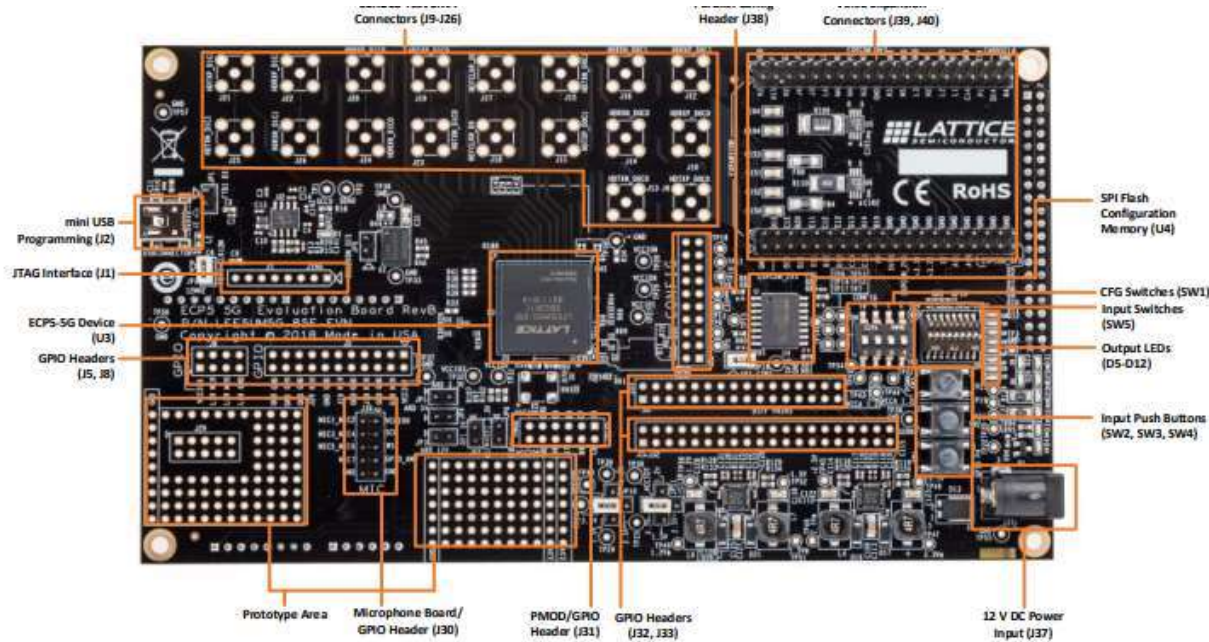
CORE I Pro AI Playground Features

5x2.1 inches

$249

- 85KLUT Standard version, Pro version: 85KLUTs
- 64K x 36 bit 3 ns High Speed SRAM
- 16G bit Flash 2Gx8 Parallel 45 ns
- SD CARD
- 4 Inch Display with PS2 Keyboard
- Arduino Hat Connectors
- High Speed SERDES Networking - Standard USB Cable

Lattice LFE5UM5G 85KLUT FPGA Dev Board

Focusing on Firmware

Figure 1.1. Top View of ECP5 Evaluation Board

$154

7x4 inches

https://www.mouser.com/ProductDetail/Lattice/LFE5UM5G-85F-EVN?qs=w%2Fv1CP2dgqoyj9CgAS78aw%3D%3D

- 85KLUTs

– 128 Mbit Serial Peripheral Interface (SPI) Flash
- Large form Factor

FPGAs vs GPU

- Test 3 different example ML algorithms

  - **FACILE**
    (batch 16000)

  - **DeepCalo**
    (batch 10)

  - **ResNet**
    (batch 10)

2k parameters ↕ 10M parameters

	GPU/FPGA aaS	Gain w.r.t. CPU
	2 ms (GPU) 0.2 ms (FPGA)	8x (GPU) 80x (FPGA)
	0.1 ms (GPU) in progress (FPGA)	750x
	1-2 ms (GPU/FPGA)	500x

https://indico.cern.ch/event/942656/contributions/3960947/attachments/2100003/3530357/irishep_aas_09sep20.pdf

FPGAs can be Faster than GPUs in Certain Applications