Dynamic Motion Sensing System

Project Work by

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Motivation

- Explore recent developments in Dynamic motion sensing aspects.

- Explore the use of Pmod ACL and BLE sensors using Vivado.

- Learn the use FPGA and vitis software

- Understand the hardware and software co-development.

Problem space

- Many dynamic motion sensing systems exist in the current world of technology. After conducting a review of various such systems it was discovered that there are limited number of such FPGA based systems.
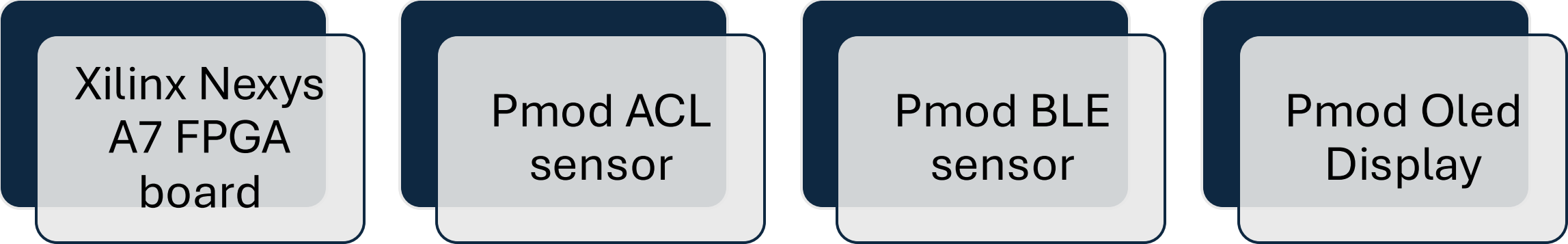
Project concept

- A dynamic motion sensing a real time system was proposed that would measure acceleration in 3D space and display it on the OLED display.

- The proposed system would consist of both hardware and embedded software parts that would make the entire system.

- This would give a global view of the entire system from bottom up approach.

System design and Block diagram
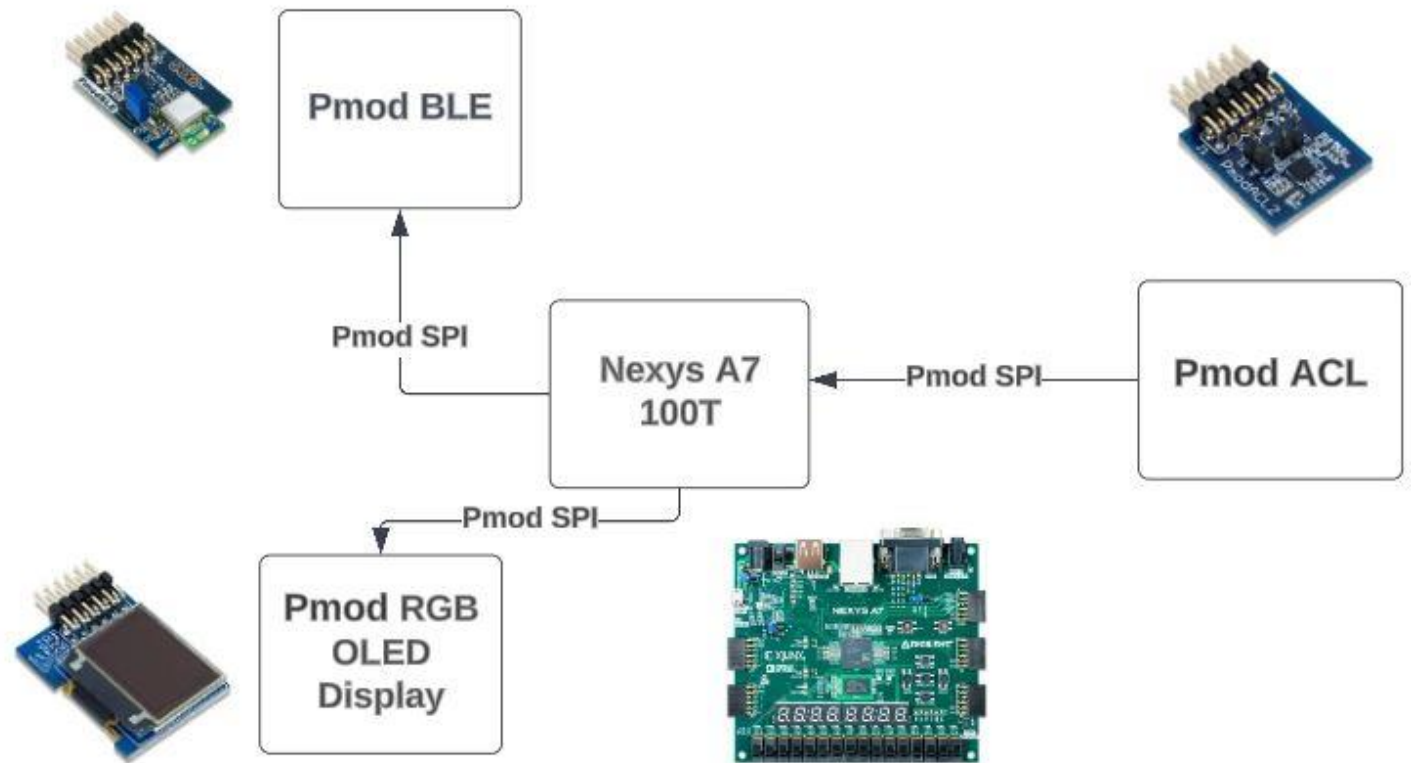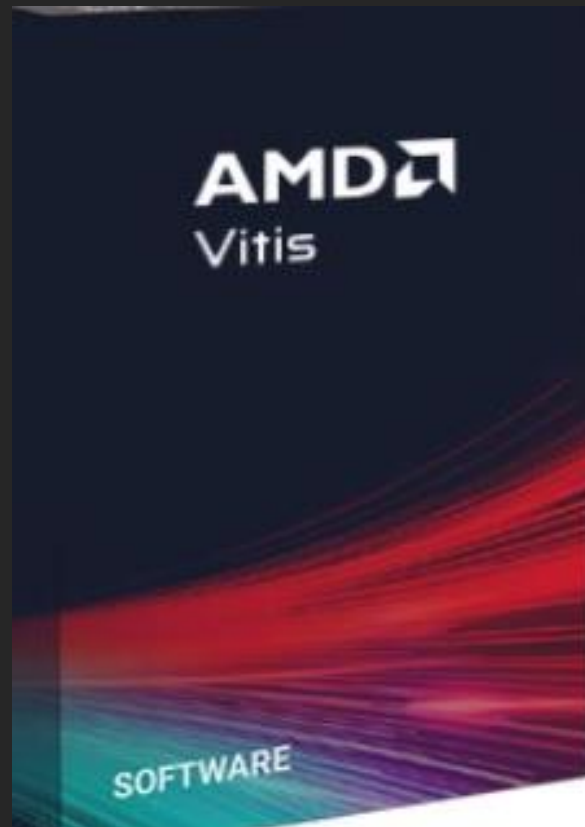
Hardware requirements

Xilinx Nexys A7 FPGA board

Pmod ACL sensor

Pmod BLE sensor

Pmod Oled Display

Software Requirements

- Vivado 2023.1
- Vitis

Conclusion

- This project gave me understanding of FPGA and vivado usage.
- Gave me an overview of a motion sensing system using IOT.
- Emboldened my understanding about integration of hardware and software system.