FPGA in automotive systems (ADAS)

Introducere

- FPGA: Field-Programmable Gate Array
- ADAS: Advanced Driver-Assistance Systems

ADAS

- Increased number of drivers -> Incresed number of accidents
- Increase in the need of smart systems and technologies to reduce the number of accidents

ADAS Challanges

- Price
- Temperature
- Performance
- Response time

FPGA in ADAS

- Ideal platform -> low power, low cost, high performance
- Reprogrammable
- Parallel processes can run on a single FPGA

Benefits of FPGAs in ADAS

- Power
- Possibility of functional partitioning parallel and serial processes
- Lower cost of implementation
- Long life span

Examples: Bird's Eye View

- Top–down 360° view
- Mainly used in parking
- Can be used in lane departure or obstacle detection

Fig 1. Bird's Eye View by Aldec

Examples :
Multi-Camera Surround View

- 4 wide-lens cameras
- Live 360° view

Examples : Driver Drowsiness Detection

- Driver drowsiness cause many car accidents
- Camera to realize driver drowsiness in the early stages
- Processing done by FPGA

Conclusion

- The driver understands the vehicle enviorment
- Reduced number of car accidents
- FPGA flexibility is great for ADAS

Bibliography

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