

FusionSense

Reliable Radar for Real-time Results

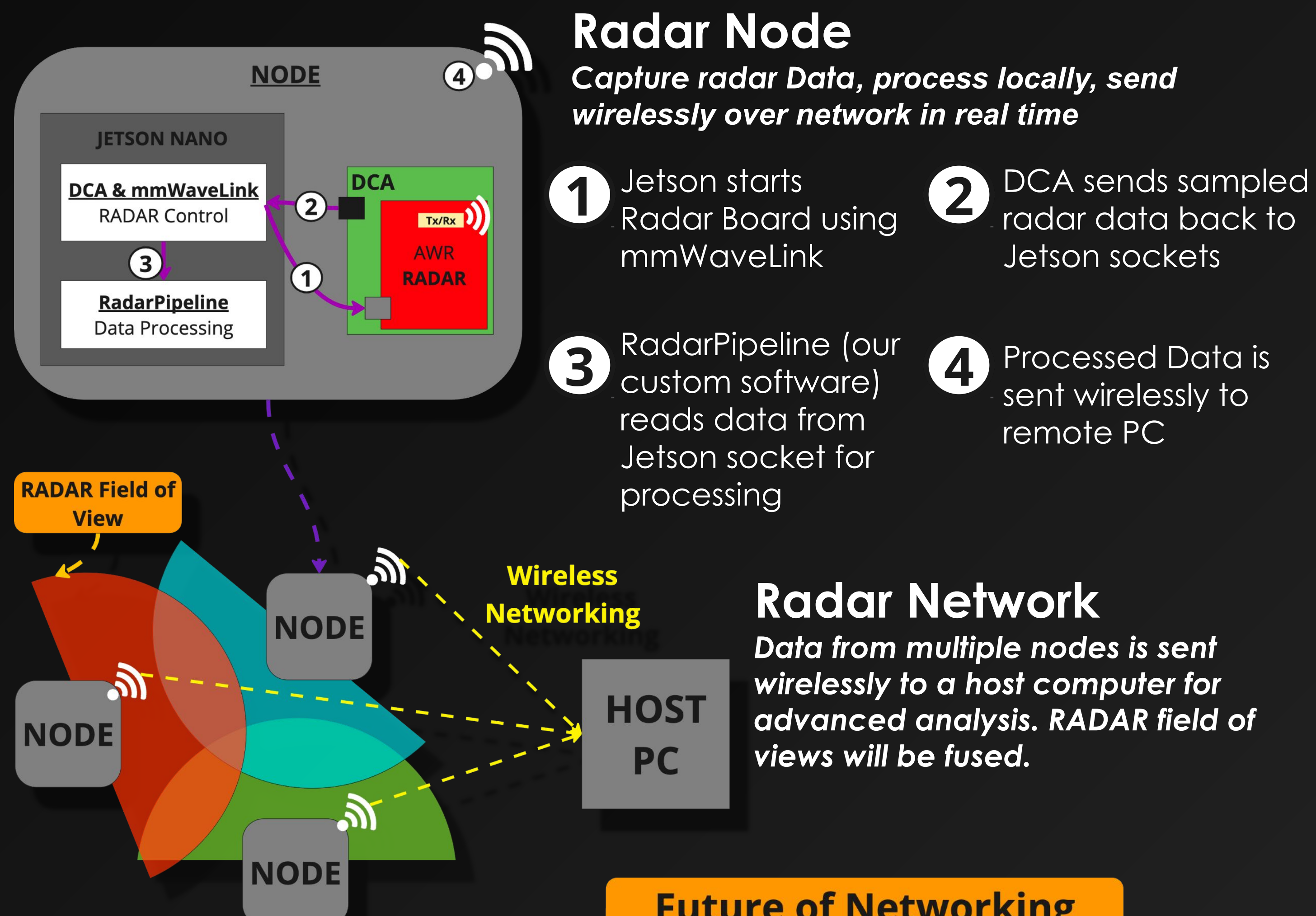
Jackie Chen | Alex Dinkelacker | Owen Convery | Nihal Singh | Philippe Rerolle

Background

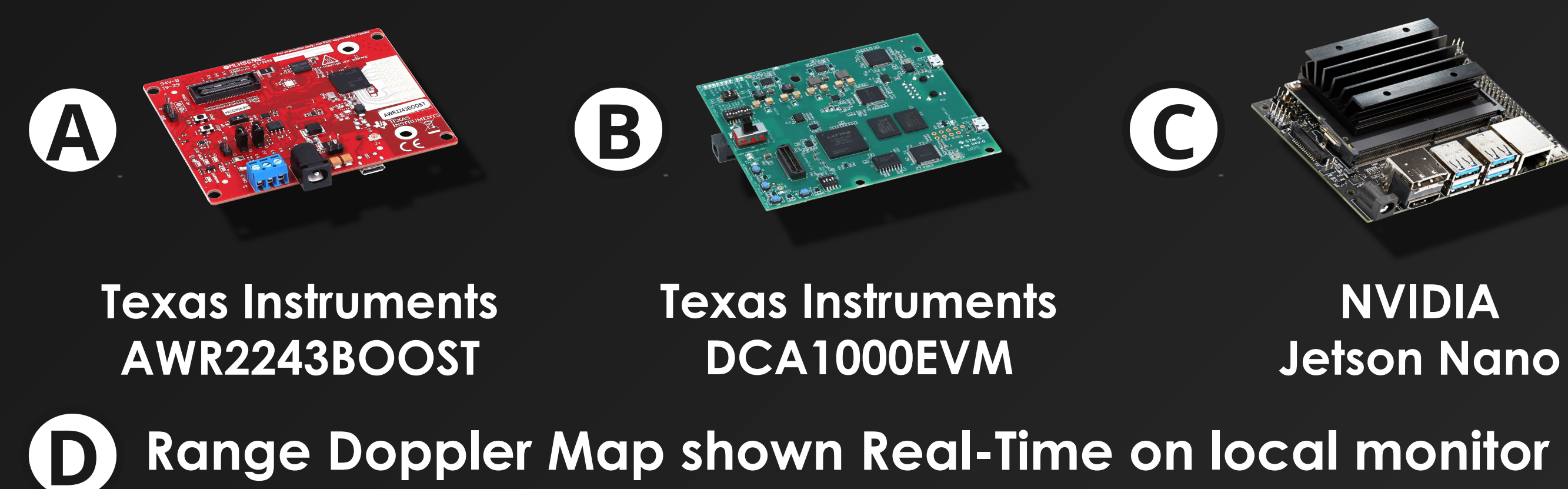
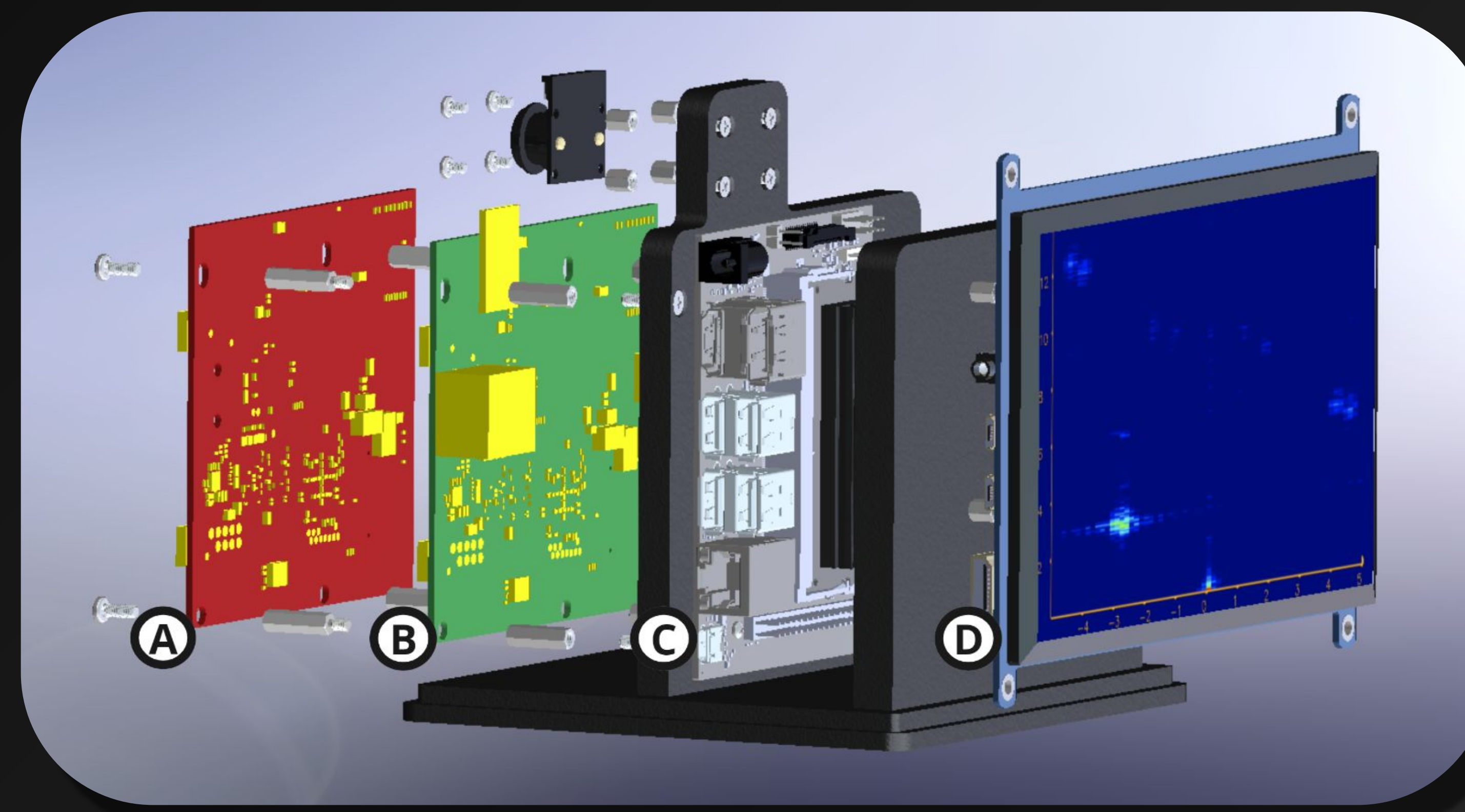
The automotive industry is rapidly integrating autonomous safety features. Visible light cameras, thermal, LIDAR, and radar are competing to be the main sensor system. Millimeter wave radar is small, affordable, and is superior in harsh conditions.

However, only objects within the line of sight can be detected. A cyclist behind a corner will not be seen by a single point radar node. A network of radar nodes would allow a reconstruction of a complete fused scene.

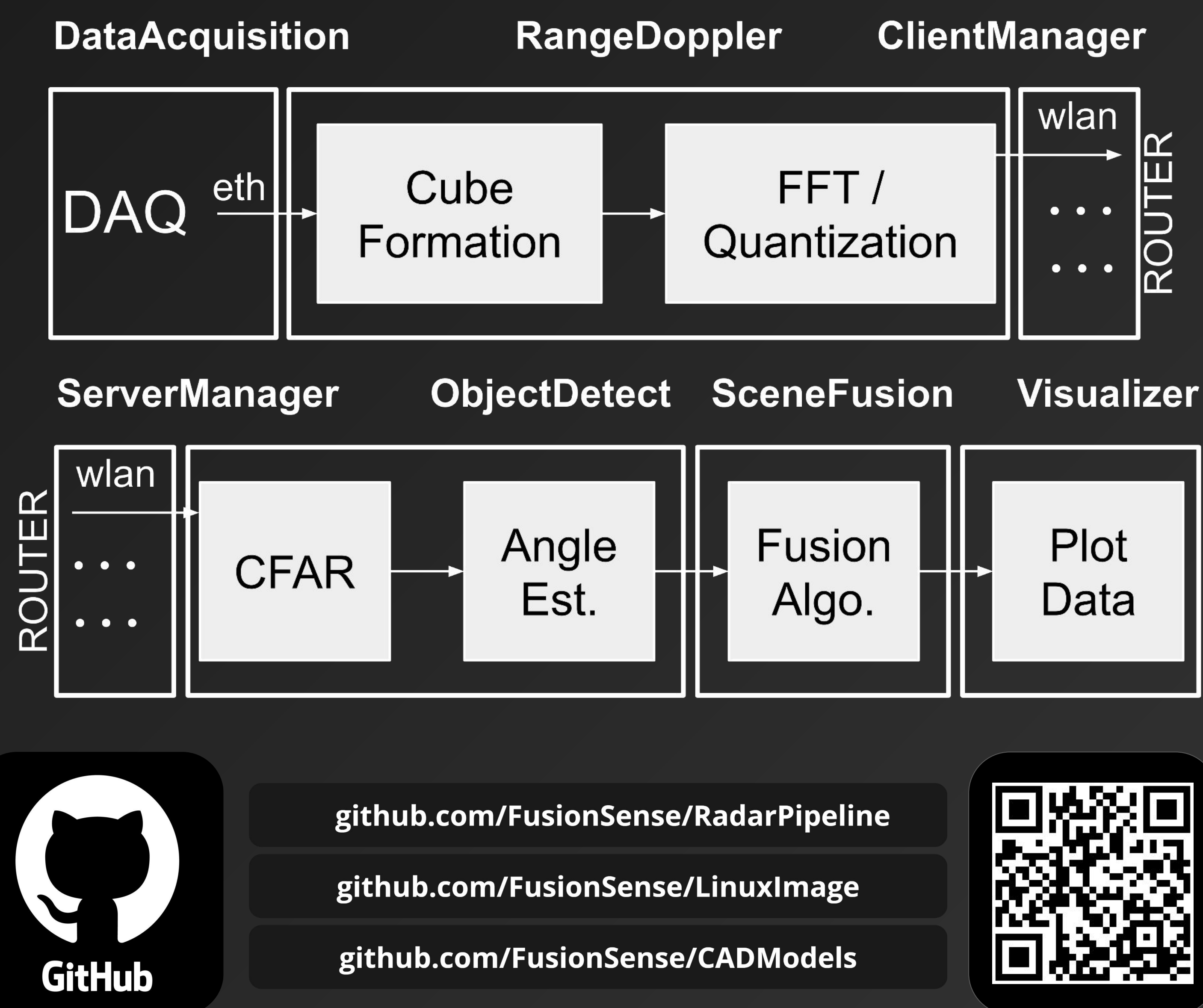
Overview



Future of Networking



Signal Flow Diagram



Software

RadarPipeline

- ↳ Custom C++ repository built by FusionSense
- ↳ Performs full signal flow from data acquisition to visualization in **real-time** using multiple threads
- ↳ Built for the **Linux** platform, running on **Jetson**
- ↳ **Open source** & available on GitHub

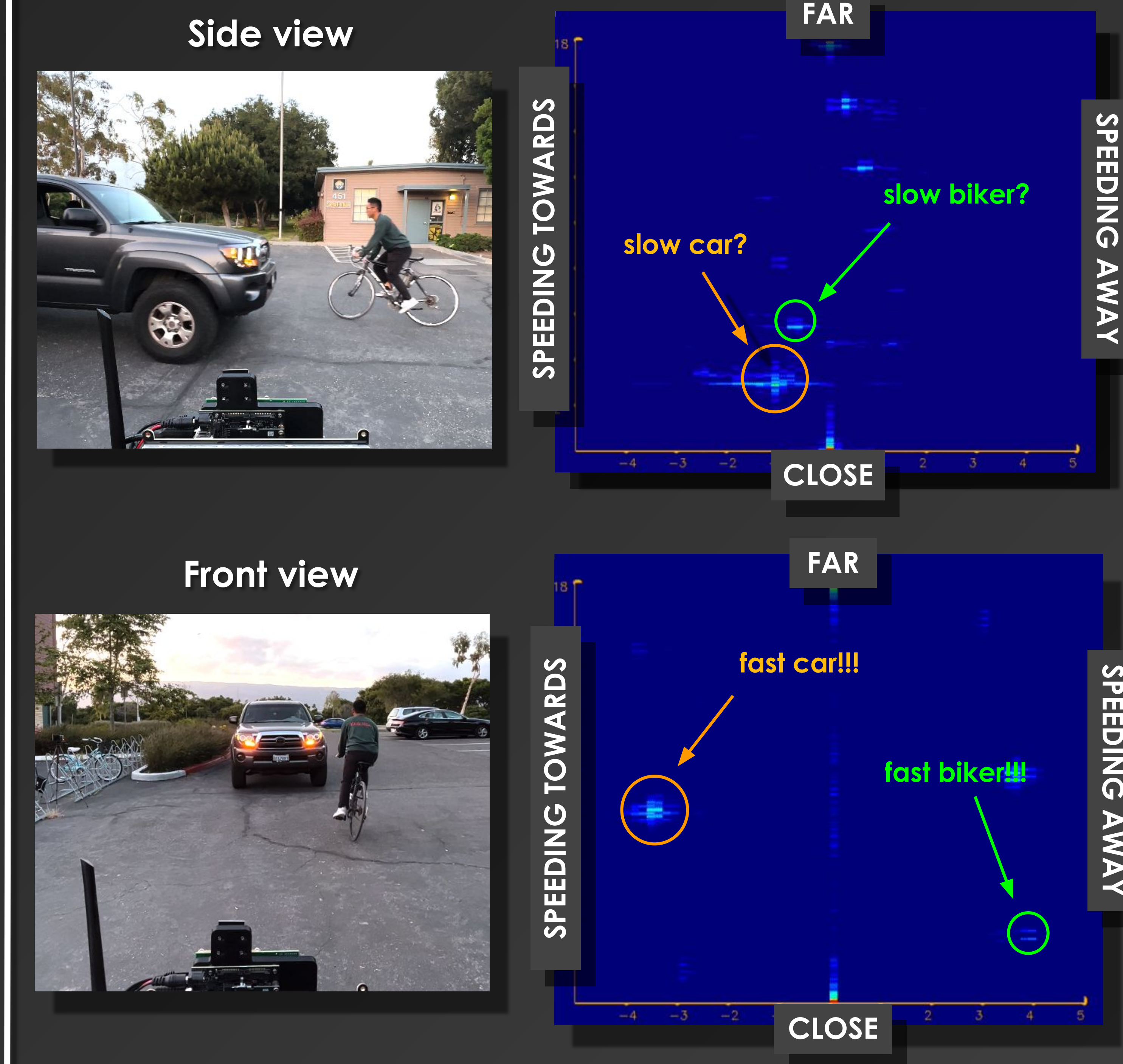
DCA1000 CLI

- ↳ Setup & Control DCA1000EVM data capture board by Texas Instruments (TI)

mmWaveLink

- ↳ Setup & Control AWR2243 radar board by TI
- ↳ Ported from Windows to Linux

Range Doppler Map Results



Acknowledgements

Capstone Advisors: Professors Ilan Ben-Yaacov & Luke Theogarajan
Project Advisors: Professors Jim Buckwalter & Upamanyu Madhoo
Special Thanks: Professor Yogananda Isukapalli, Daniel Gusland
Capstone TA: Shaan Sandhu

Collaborators



Sponsor



UC SANTA BARBARA
College of Engineering