

Real-Time AI at the Edge Vision & Speech Systems

Day	Session Title	Content Summary	Learning Outcome
Day 1	Introduction to Edge Computing, Architectures & Hardware	- Definition & importance of Edge Computing	Participants gain conceptual clarity on Edge Computing and hardware ecosystems
		- Comparison: Edge vs Cloud vs Fog	
		- Use cases: Healthcare, Surveillance, Industry 4.0	
		- Overview of Edge hardware: Jetson, Pi, Coral	
Day 2	Software Tools for Edge AI (Jetson Focus)	- JetPack SDK overview	Understand the Jetson software stack and tools for deploying AI on edge
		- Jetson Orin Nano setup	
		- AI Frameworks: PyTorch, ONNX, TensorRT	
		- Docker, DeepStream overview	
		- Model deployment basics	
Day 3	Real-time Object Detection on Jetson Orin Nano (Hands-on Demo)	- YOLOv8 for object detection	Learn end-to-end real-time object detection on Jetson Orin Nano
		- Using camera with Jetson	
		- Live inference pipeline using OpenCV + Ultralytics	
		- Optional: TensorRT acceleration	
Day 4	Edge vs Cloud Computing + Whisper Model (Theory + Cloud Demo)	- Edge vs Cloud: Latency, privacy, cost	Understand architectural decisions & experience Whisper demo on cloud
		- When to use edge?	
		- Whisper model introduction	
Day 5	Speech Recognition on Jetson: Whisper on the Edge (Hands-on Demo)	- Deploy Whisper.cpp / Whisper-tiny on Jetson	Hands-on deployment of a speech AI model locally on an edge device
		- Microphone/audio setup	
		- Run real-time speech-to-text	
		- Optional: Use case like subtitle generation	

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