Jetson Nano Setup

Murat Sever

Outline

- About me
- Schedule
- Jetson Nano Developer Kit
- Initial setup
- Connection
- Resources

4-Week Schedule

- January 12 - Nano Setup
- January 19 - Nano AI
- January 26 - Nano AI
- February 2 - NO CLASS!!!
- February 9 - Review

About Me

- 25 years in Software Development
- Last 10+ years in Telecom field
- PhD student @ TOBB ETÜ
- Part-time Lecturer @ TOBB ETÜ
  - 2021-2022 Summer ELE361L course (Telecom Lab)
  - 2022-2023 Fall ELE361L course (Telecom Lab)
  - 2023-2024 Fall ELE361L course (Telecom Lab)

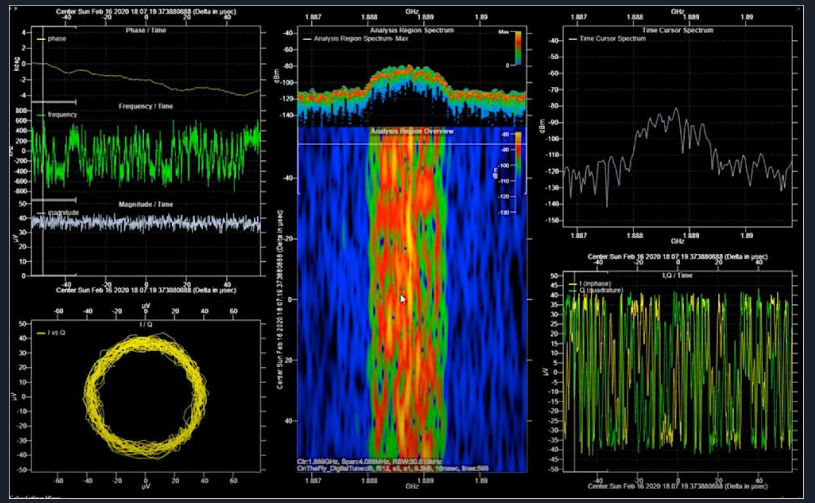
Embedded Experience - Monitoring Receivers

TI 8-core DSP/SysBIOS

Intel i7/VxWorks

SIGINT: Signal Analysis Project

- Offline/Online Analysis
- Demodulation/Decoding
- Parameters
  - Center Freq
  - Modulation Type
  - Baud Rate

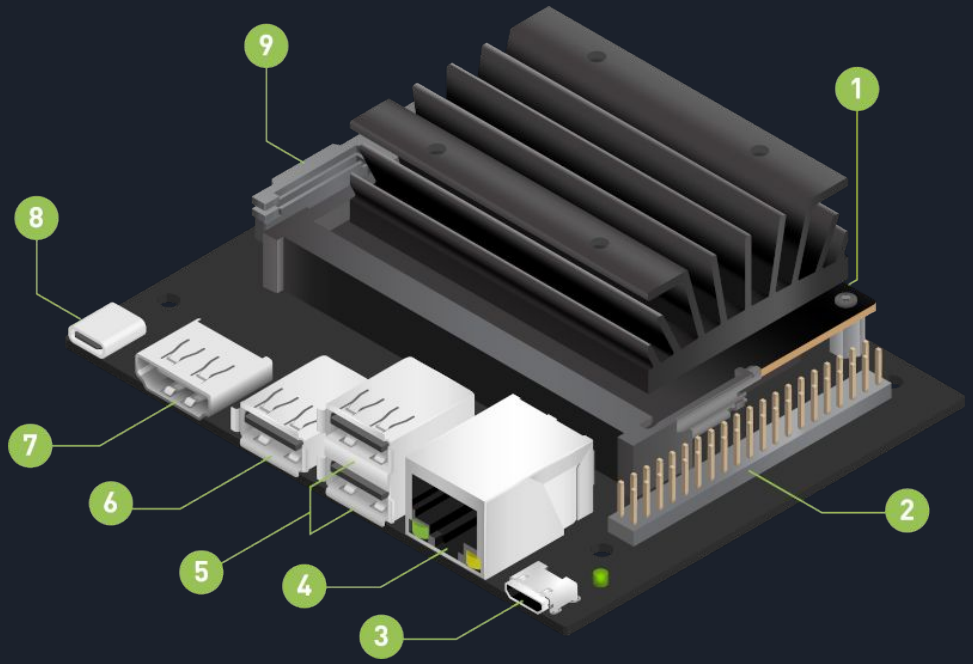


SDR Experience

Jetson Nano Developer Kits

- Jetson Nano 4GB Developer Kit
- Jetson Nano 4GB Developer Kit Revision B01
- Jetson Nano 2GB Developer Kit

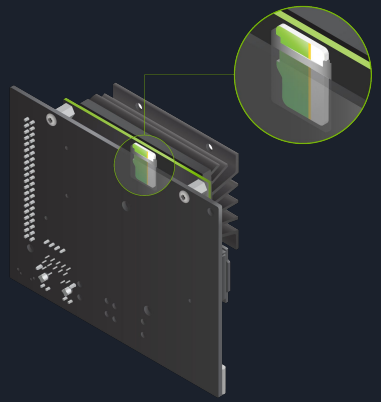
Jetson Nano 2GB Developer Kit



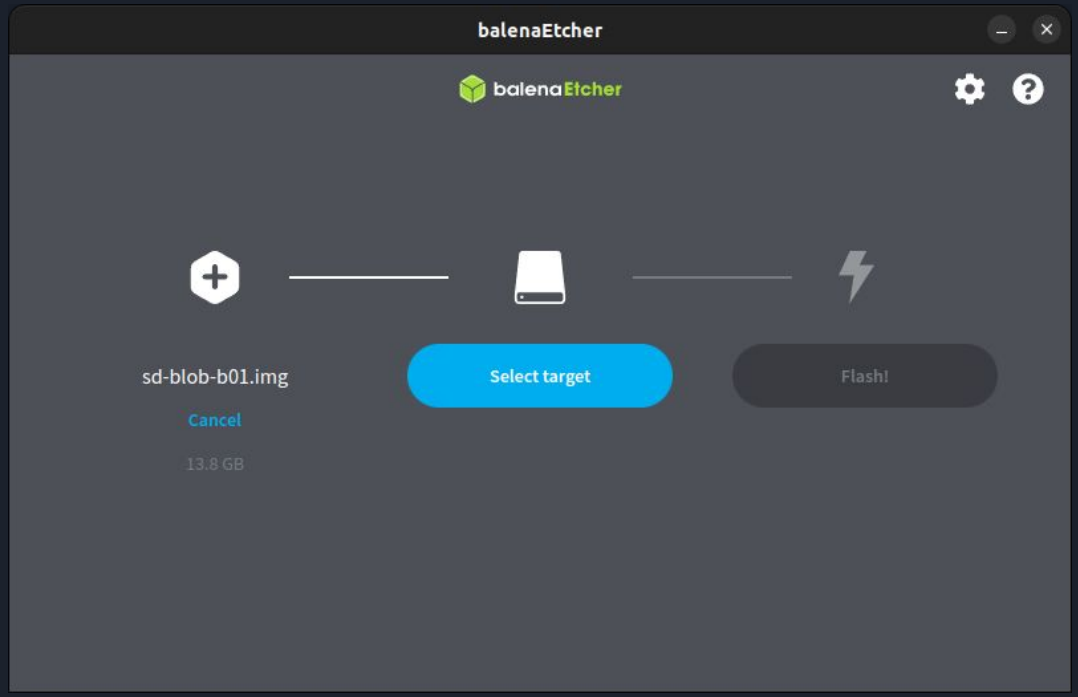
Getting Started with Jetson Nano 2GB Developer Kit

https://developer.nvidia.com/embedded/learn/get-started-jetson-nano-2gb-devkit

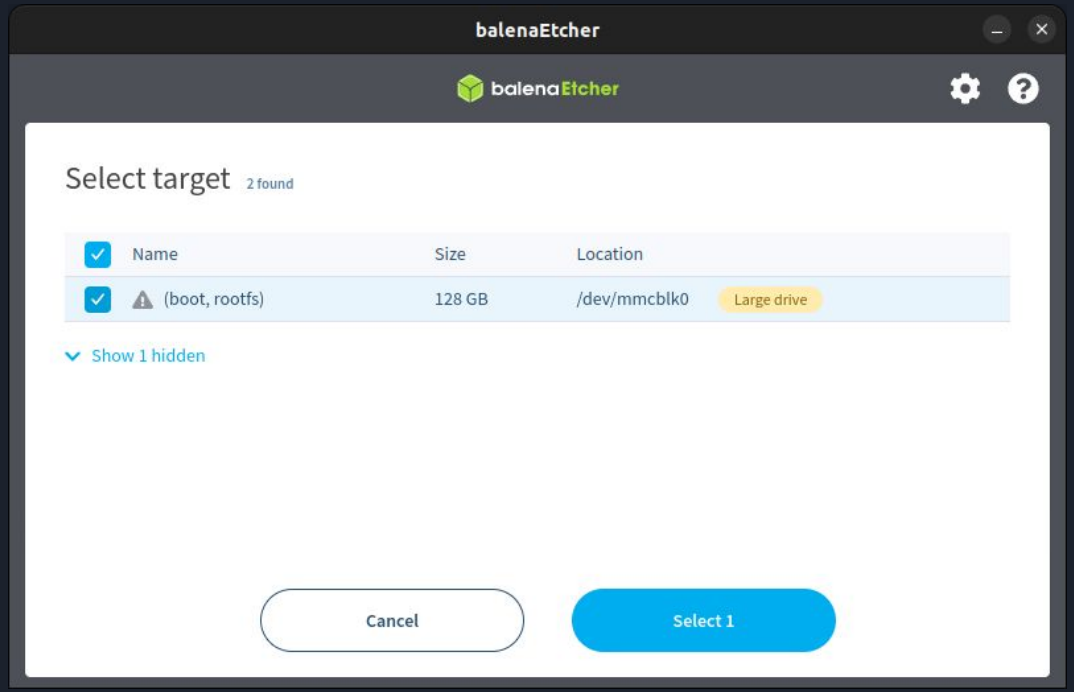
- Write Image to the microSD Card
- 128 GB recommended



Jetson Nano - SD Card Image



Select target



Jetson Nano 2GB Developer Kit User Guide

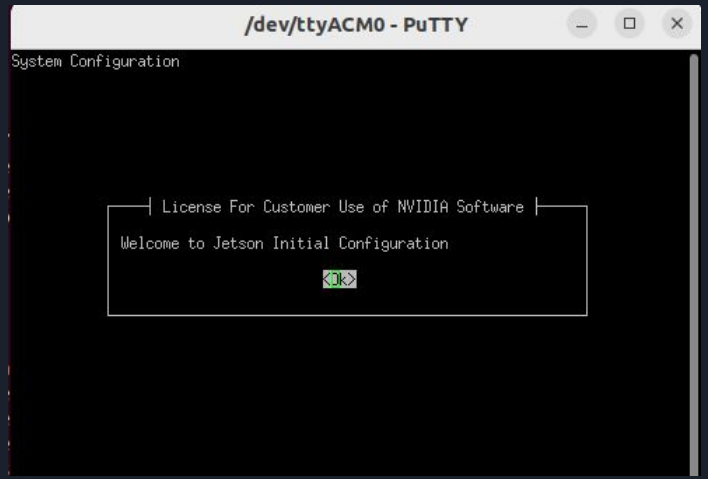
- https://developer.nvidia.com/embedded/learn/jetson-nano-2gb-devkit-user-guide
- Initial setup with display attached OR
- Headless Operation
  - handy when you don't have a display
  - connect over kit's Micro-USB port

Initial Setup

	Initial setup with display attached	**Initial setup in headless mode**
Monitor, keyboard and mouse	Required	Not required
Extra computer	Not required	Required

Headless Mode Setup

- Linux
  - /dev/ttyACM0 115200



First Boot

- Review and accept NVIDIA Jetson software EULA
- Select system language, keyboard layout, and time zone
- Create username, password, and computer name
- Optionally configure wireless networking
- Select APP partition size. It is recommended to use the max size suggested
- Create a swap file. It is recommended to create a swap file

Linux for Tegra - L4T

- Read INDEX.txt
- USB Device Mode
  - features that are exposed to a connected host PC

USB Device Mode

- Implement various protocols using a USB cable
- The following implemented protocols can be used at the same time:
  - Ethernet: allows system login using SSH and high-bandwidth file copying using SFTP.
  - UART/Serial: allows system login using a terminal application.
  - USB Mass Storage: Similar in concept to a USB memory stick.

Ethernet

- Host: 192.168.55.100
- Jetson Nano: 192.168.55.1
- ssh nano@192.168.55.1
- you may also use PuTTY
  - sudo putty
- Get familiar with Linux commands!

A Few Linux Commands

- Connect to Nano
- Try
  - ls -al
  - pwd
  - who
  - whoami
  - uname -a
  - free -m
  - python –version
  - python3 –version

Serial

- Windows: hyperterminal or putty
- Linux: sudo putty
  - /dev/ttyACM0 115200, 8N1

WiFi

- sudo nmcli device wifi connect 'SSID' password 'PASSWORD'
- On your PC navigate to the ELE495 repo
  - https://github.com/ELE495-2324Spring/JetsonNano
  - Download the setup file
- On Nano
  - Check your Internet connection
  - wget https://github.com/ELE495-2324Spring/JetsonNano/blob/main/1-JetsonNanoSetup.pdf

Host Gateway ???

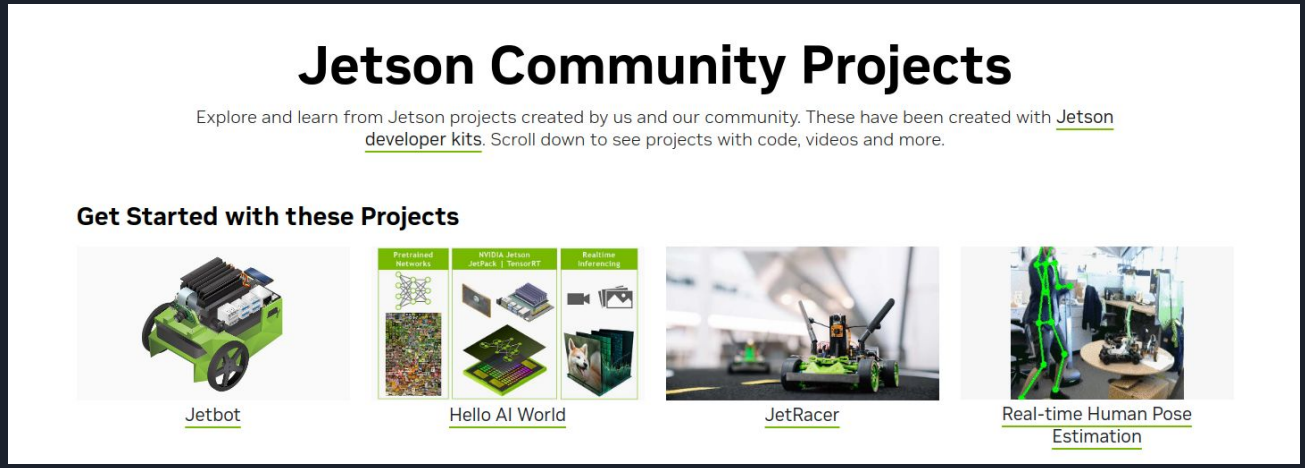
- configure your host as a gateway for Jetson
  1. Enable IP forwarding
     a. echo 1 > /proc/sys/net/ipv4/ip_forward
  2. Enable Network Address Translation (NAT)
     a. iptables -t nat -A POSTROUTING -o eth0 -j SNAT --to 192.168.1.100

VNC ???

- Enabling the VNC Server
- Connecting to the VNC server

Jetson Community Projects

https://developer.nvidia.com/embedded/community/jetson-projects



Developer Forum

https://forums.developer.nvidia.com/c/agx-autonomous-machines/jetson-embedded-systems/jetson-nano/76

DLI Courses

- Building Video AI Applications at the Edge on Jetson Nano
  - https://courses.nvidia.com/courses/course-v1:DLI+S-IV-02+V2/
- Getting Started with AI on Jetson Nano
  - https://courses.nvidia.com/courses/course-v1:DLI+S-RX-02+V2/
  - https://developer.nvidia.com/embedded/learn/jetson-ai-certification-programs

Jetson GPIO Python library

https://github.com/NVIDIA/jetson-gpio