

CanSat Project – Miniature Satellite Simulation



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Course: Electronics Laboratory

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Introduction to CanSat



Can-sized Mini Satellite

A compact, educational tool for space simulation.



Education & Research

Designed for hands-on learning and scientific exploration.



Data Collection

Gathers pressure, altitude, and acceleration data.



Low-Cost Simulation

An affordable alternative to real satellite development.

Addressing the Challenge

High Cost of Real Satellites

Traditional satellite construction is prohibitively expensive.

Lack of Hands-on Experience

Students often miss practical exposure to satellite technology.

Need for Affordable Solutions

A simple, cost-effective platform is essential for learning.

Project Objectives

01

Design & Build CanSat

Construct a functional can-sized satellite.

03

Transmit Data via LoRa

Send collected data wirelessly to a ground station.

02

Collect Sensor Data

Gather environmental and motion data.

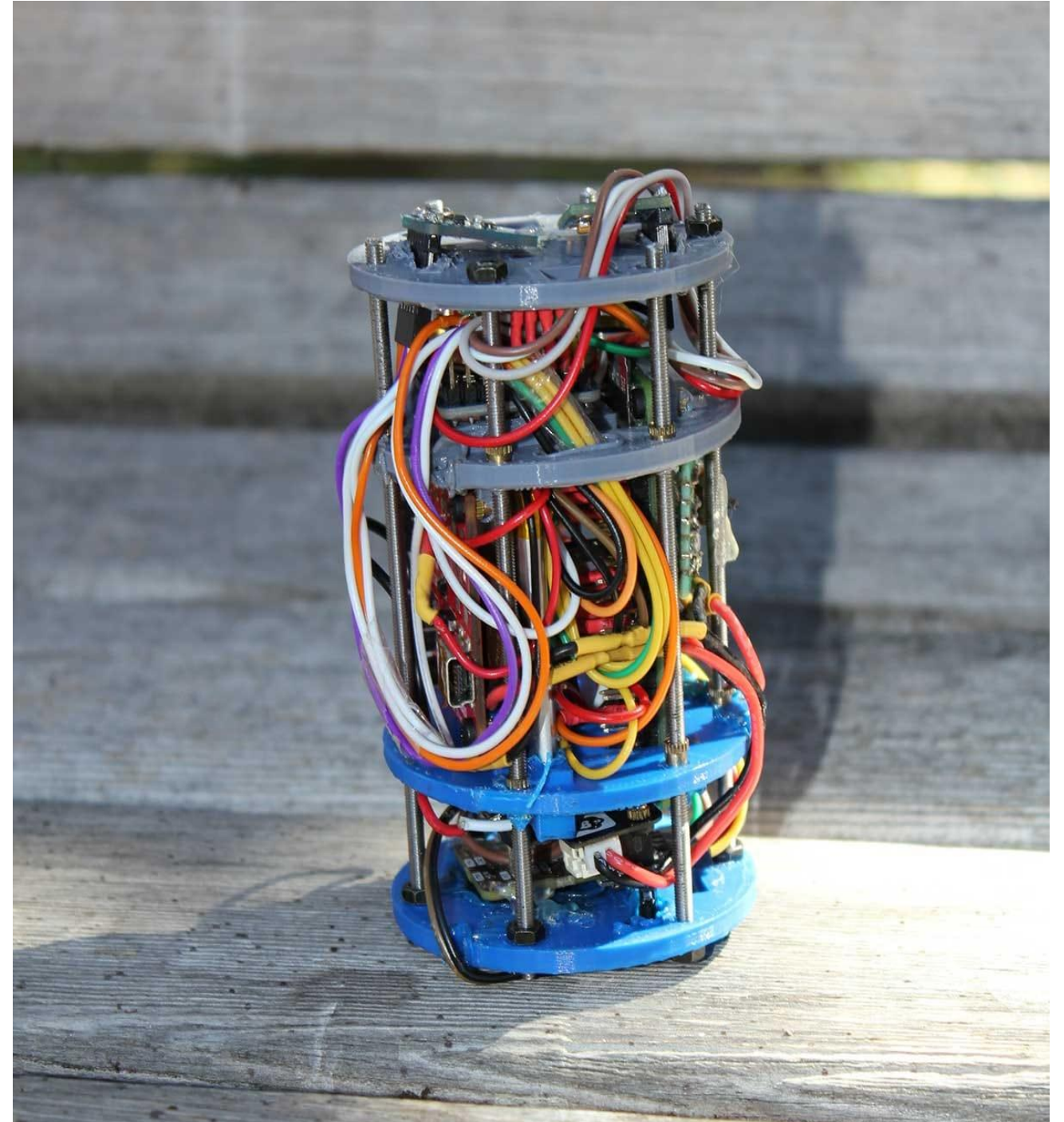
04

Analyze Received Data

Interpret and evaluate the transmitted information.

Key Components

- Arduino Nano R3: Main controller
- SX1276 LoRa Module: Wireless data transmission
- ADXL345 Accelerometer: Measures acceleration
- BMP280 Sensor: Measures pressure & altitude
- Li-ion Battery + Holder: Power supply
- Breadboard & Wires: Circuit connections

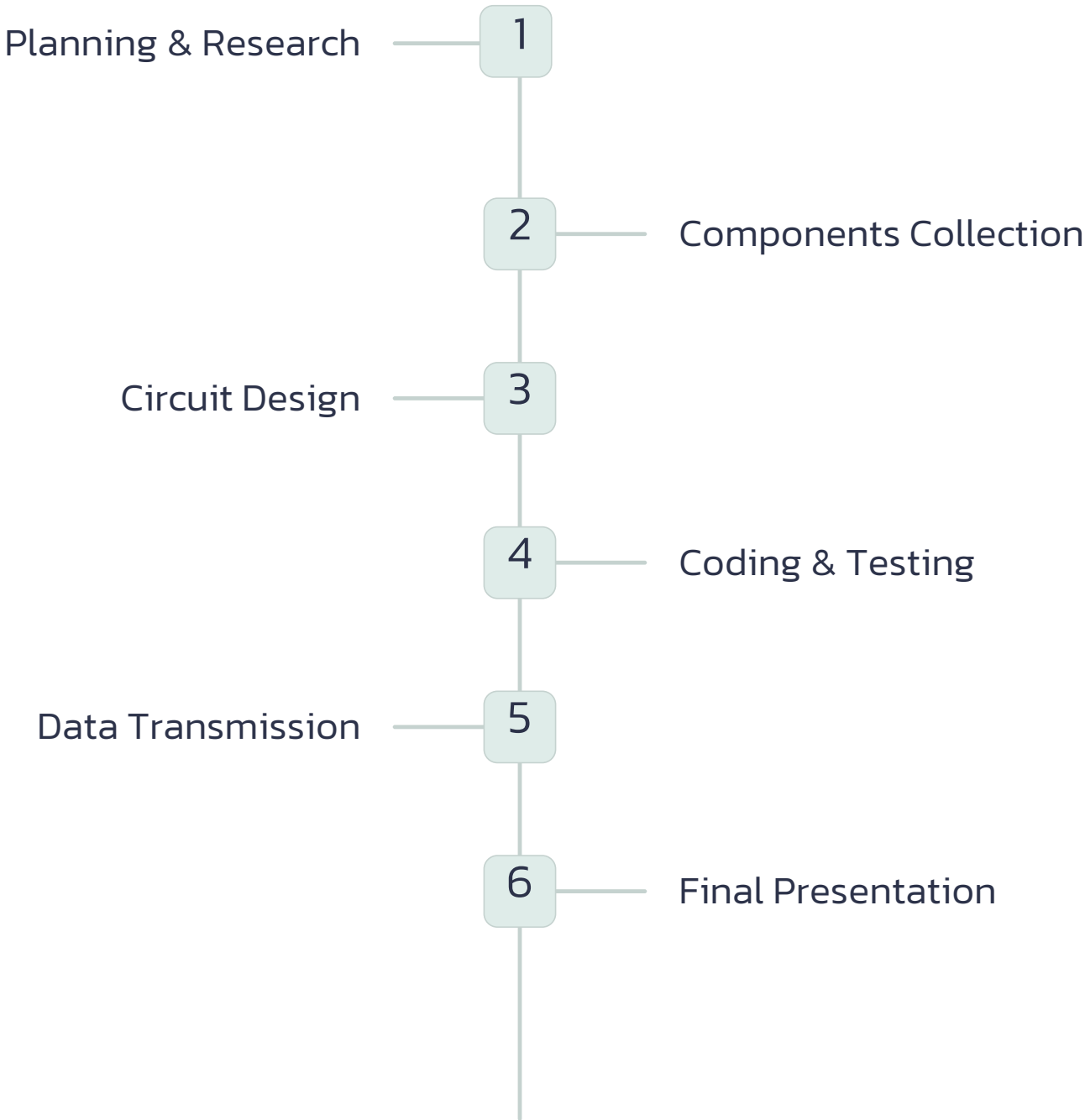


Working Principle



Our CanSat operates by collecting data through various sensors, which is then processed by the Arduino. This processed information is wirelessly transmitted via the LoRa module to a ground station, where it is received and logged for analysis.

Development Timeline



Implementation & Testing

The circuit was meticulously built on a breadboard, connecting sensors to the Arduino, and then to the LoRa module.

Successful data transmission from the CanSat to the ground station was achieved, confirming system functionality.

Comprehensive testing validated the entire setup, ensuring reliable performance.



Project Budget

Arduino Nano	450
LoRa SX1276	950
BMP280 Sensor	350
ADXL345 Sensor	300
Battery & Holder	300
Others	600
Total	3,450 BDT

Future Scope & Facilities

Future Enhancements

- Add GPS for tracking
- Integrate a camera for imaging
- Enhance data logging and storage
- Conduct rocket launch simulations

CanSat Facilities

- Data Telemetry & Logging
- Altitude Tracking
- Environmental Monitoring
- Payload Experimentation
- Communication Practice

Expected Final output

- Successfully built a working CanSat
- Cost-effective and efficient project
- Useful for students and researchers
- Great potential for future development

