**🧾 🎯 Project Title: The Optimization of the Control System  
📅 Project Timeline:** July 2021 – September 2021  
🎥 YouTube Demo: To be added  
📦 GitHub Source Code: <https://github.com/IvanSicaja/2021.07.01_GitHub_The-Optimization-of-the-Control-System>  
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🏷️ My Personal Profiles: ⬇︎  
🎥 Video Portfolio: To be added  
📦 GitHub Profile: [https://github.com/IvanSicaja](https://github.com/IvanSicaja?utm_source=chatgpt.com)  
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📚🔍 **Project description:** ⬇︎⬇︎⬇︎

💡 **App Purpose**  
The goal of this project was to replace a basic **ON-OFF regulator** for a **DC motor control system** with a more advanced **PID regulator**. The task involved designing a controller to keep a mounted horizontal plate balanced despite system rotations, ensuring higher precision, stability, and robustness compared to the ON-OFF regulator.

🧠 **How It Works**

* System setup: A **DC motor** with two shafts, one connected to a **horizontal plate**, the other to an **encoder**.
* Position and tilt detection: Measured using an **Adafruit BNO055 gyroscope** and the encoder.
* Control algorithm: Implemented a **PID controller** on an **Arduino Nano**, tuned to reduce overshoot, improve precision, and minimize oscillations.
* Analysis tools: Used **Arduino IDE Serial Plotter** to observe system response, optimize **Kp, Ki, and Kd** parameters, and evaluate real-time performance.
* The system achieved significantly smoother and more accurate stabilization compared to the ON-OFF controller.

⚠️ **Note**  
None.

🔧 **Tech Stack**  
Arduino Nano, C/C++ (Arduino), Adafruit BNO055, Encoder, DC Motor, PID Control, Serial Plotter

📣 **Hashtags Section**  
# #Arduino #PID #DCMotor #Automation #ControlSystems #EmbeddedSystems #Sensors #Electronics #Innovation