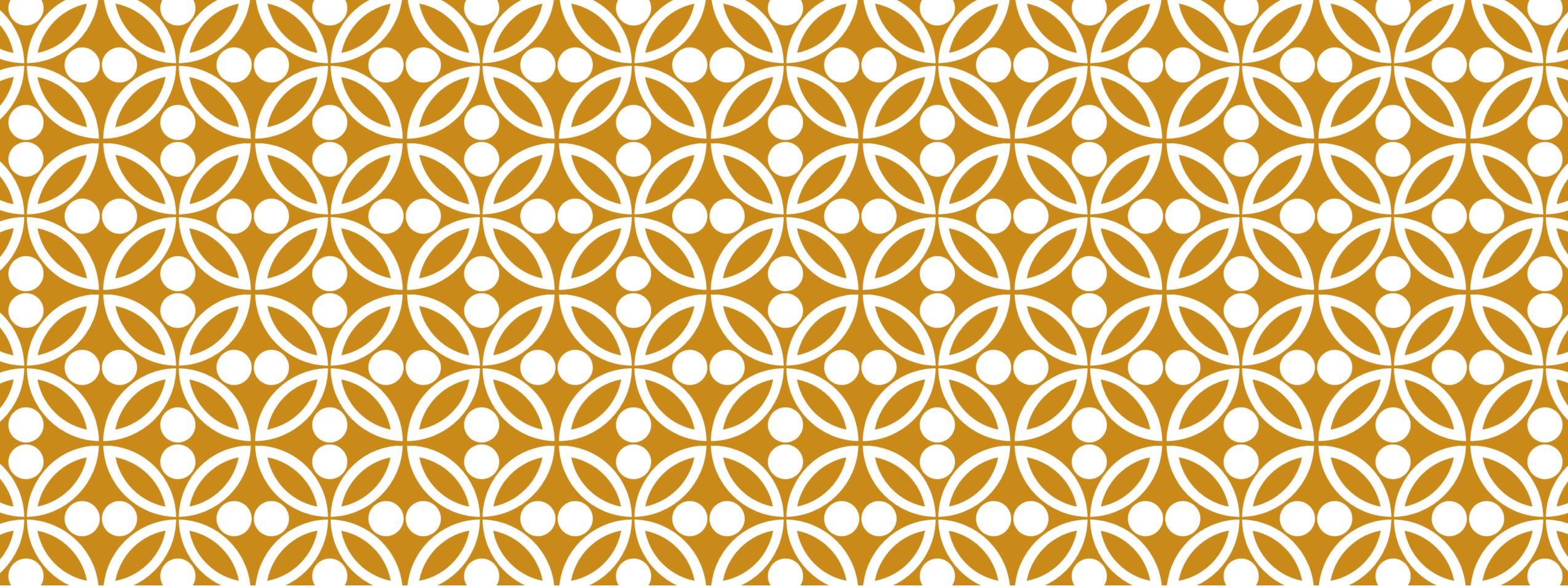


السلام عليكم ورحمة الله وبركاته

GOOD AFTERNOON



# DUAL AXIS SUN TRACKING SYSTEM

BY

Taha And Omar

# SOLAR TRACKING SYSTEM — WHAT?

- Definition of Photovoltaics (PV)

“Photovoltaics is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current results that can be used as electricity.”

- The motion of the Sun (angles):

- Azimuth

- Tilt

- Slope

# SOLAR TRACKING SYSTEM — (WHY AND HOW ?)

- Why is it insufficient to use stationary ?
- What are the choices for design ?
- What are the methodologies to track the sun ?



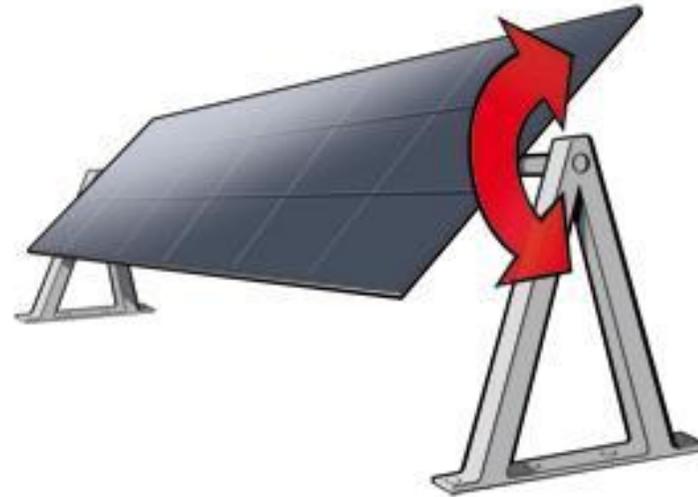
# REQUIREMENTS

- Cost – effective

- Power minimized

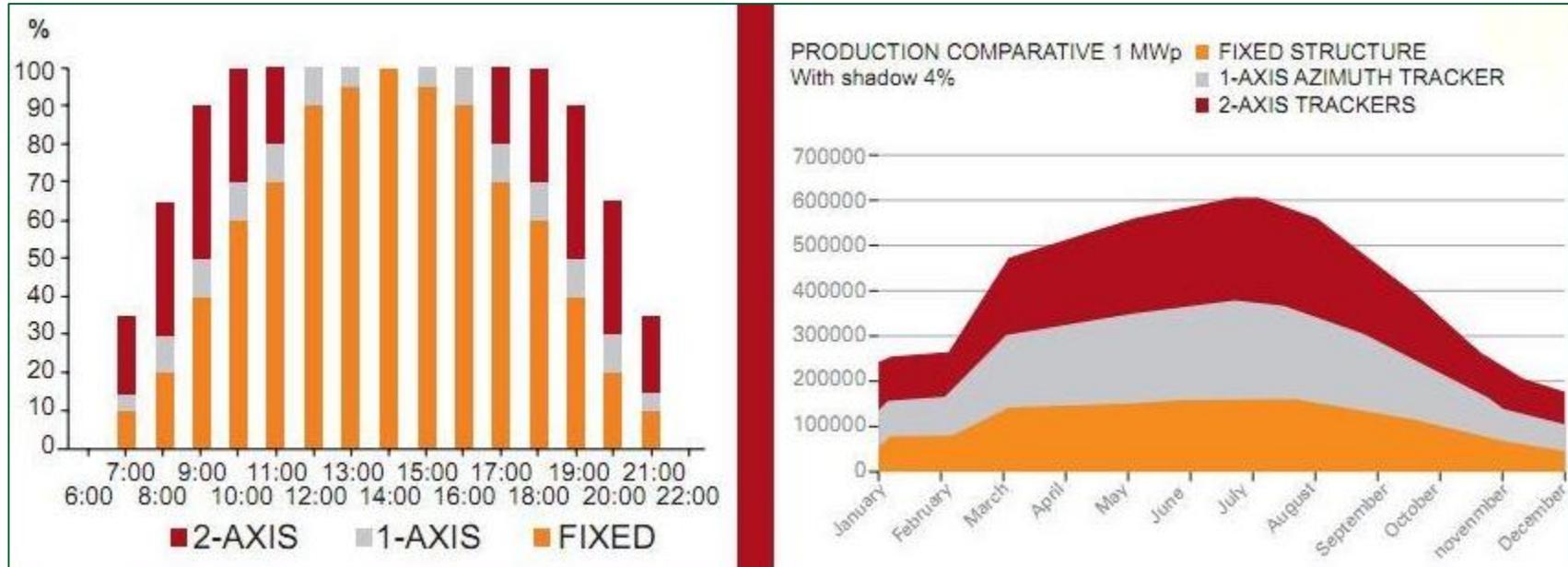
# DESIGN - SINGLE AXIS TRACKING

- What is the major issue ?
- How to implement (Mechanical aspect)



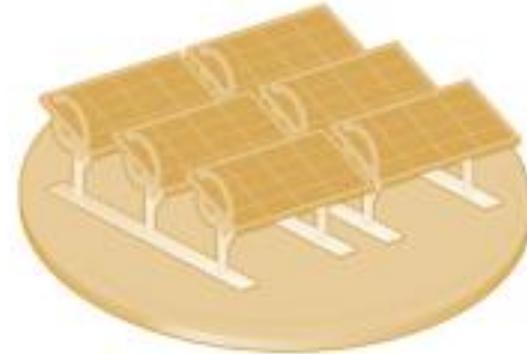
# DESIGN – DUAL AXIS TRACKING (ADVANTAGE ?)

- Higher efficiency
- 20 – 54 % increase in amount of absorbed power.

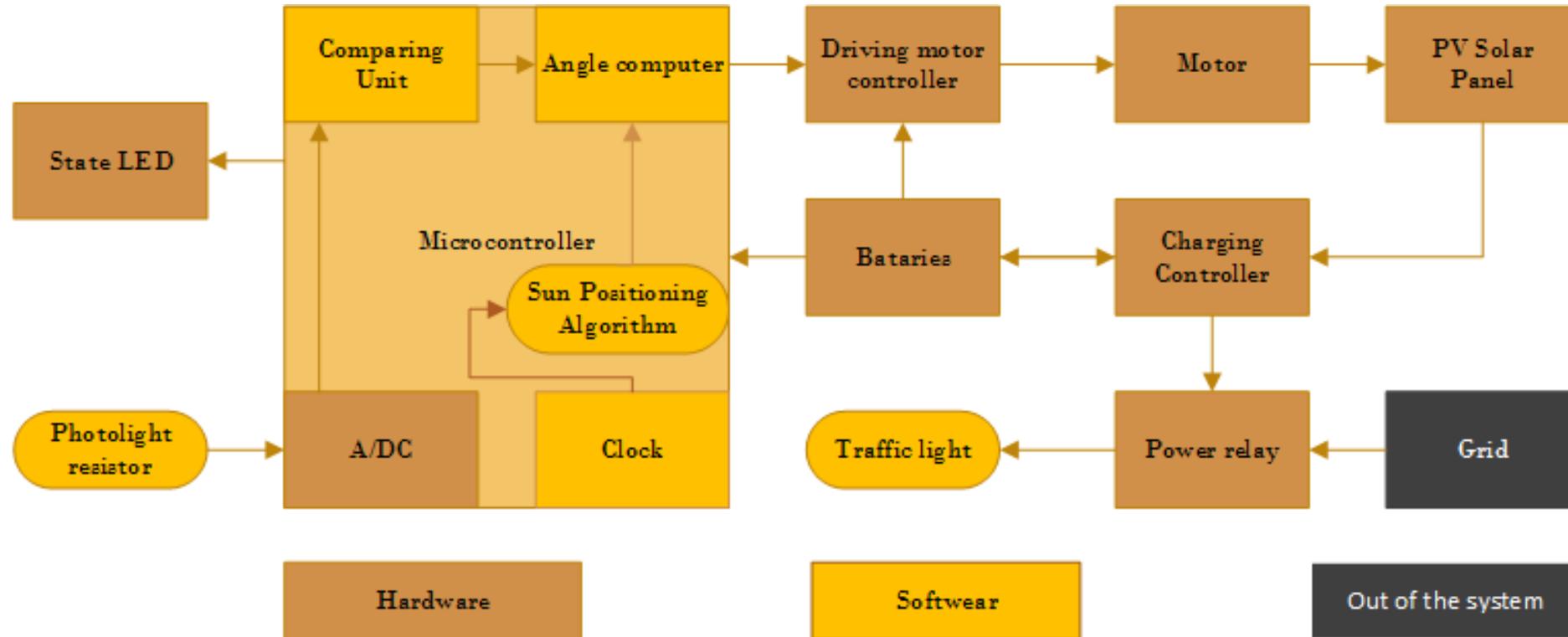


# DESIGN — DUAL AXIS TRACKING (MECHANICAL)

- How to implement ? (Mechanical aspect)
- Three Approaches.

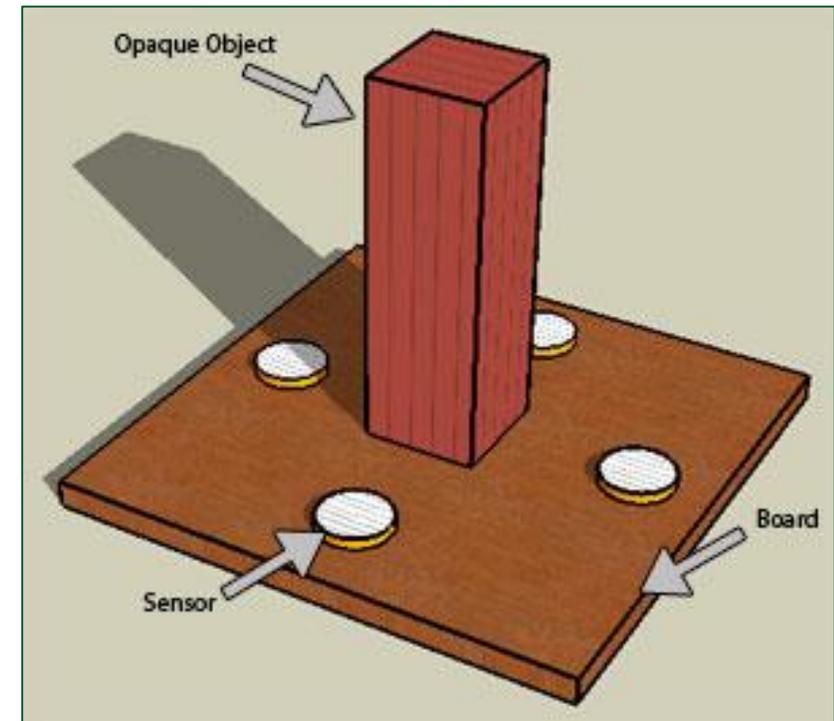


# SYSTEM ARCHITECTURE



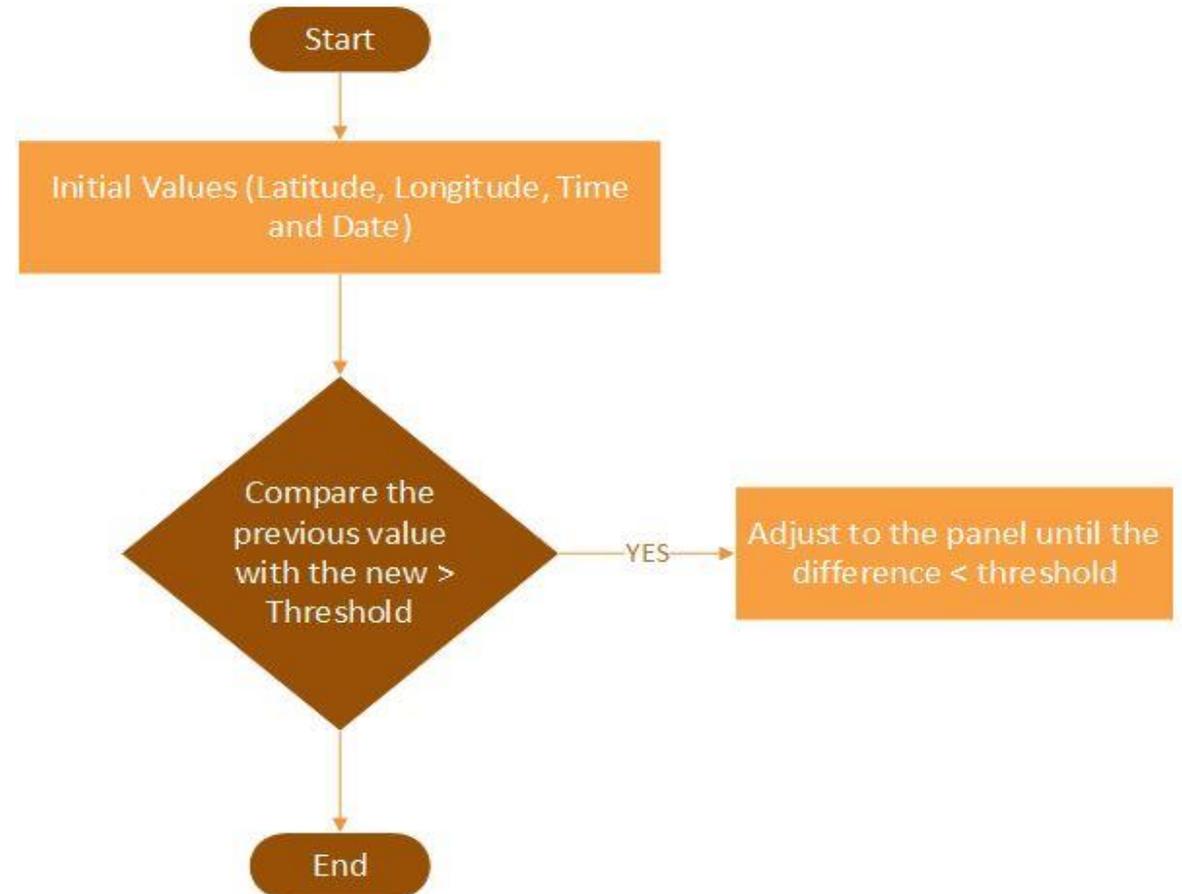
# 1<sup>ST</sup> METHOD — SENSORS (HOW ?)

- Four sensors (West – East and North and South)
- Difference and Threshold



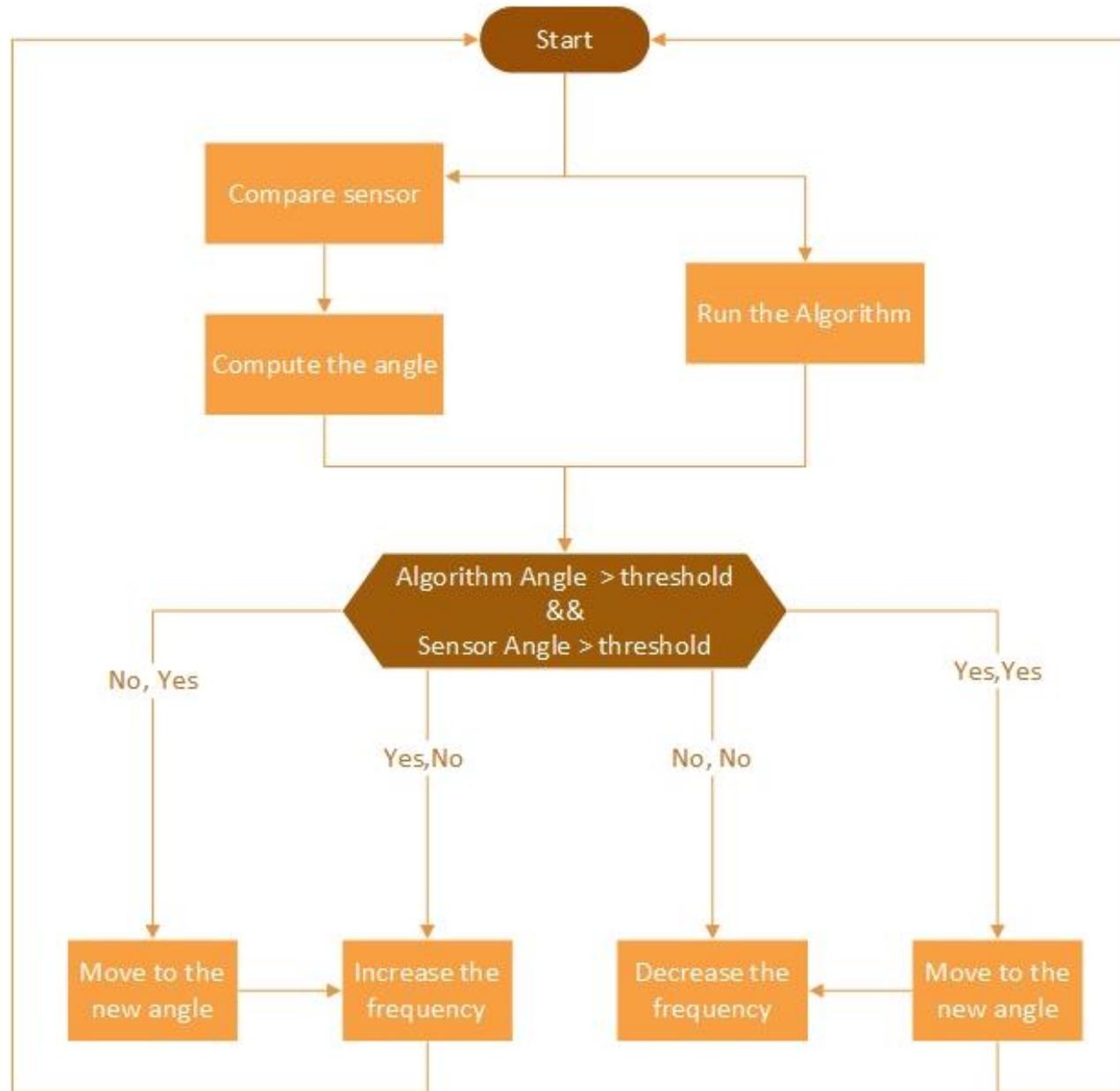
# 2<sup>ND</sup> METHOD – TRACKING ALGORITHM

- What does the algorithm do ?
- Difference and Threshold ?



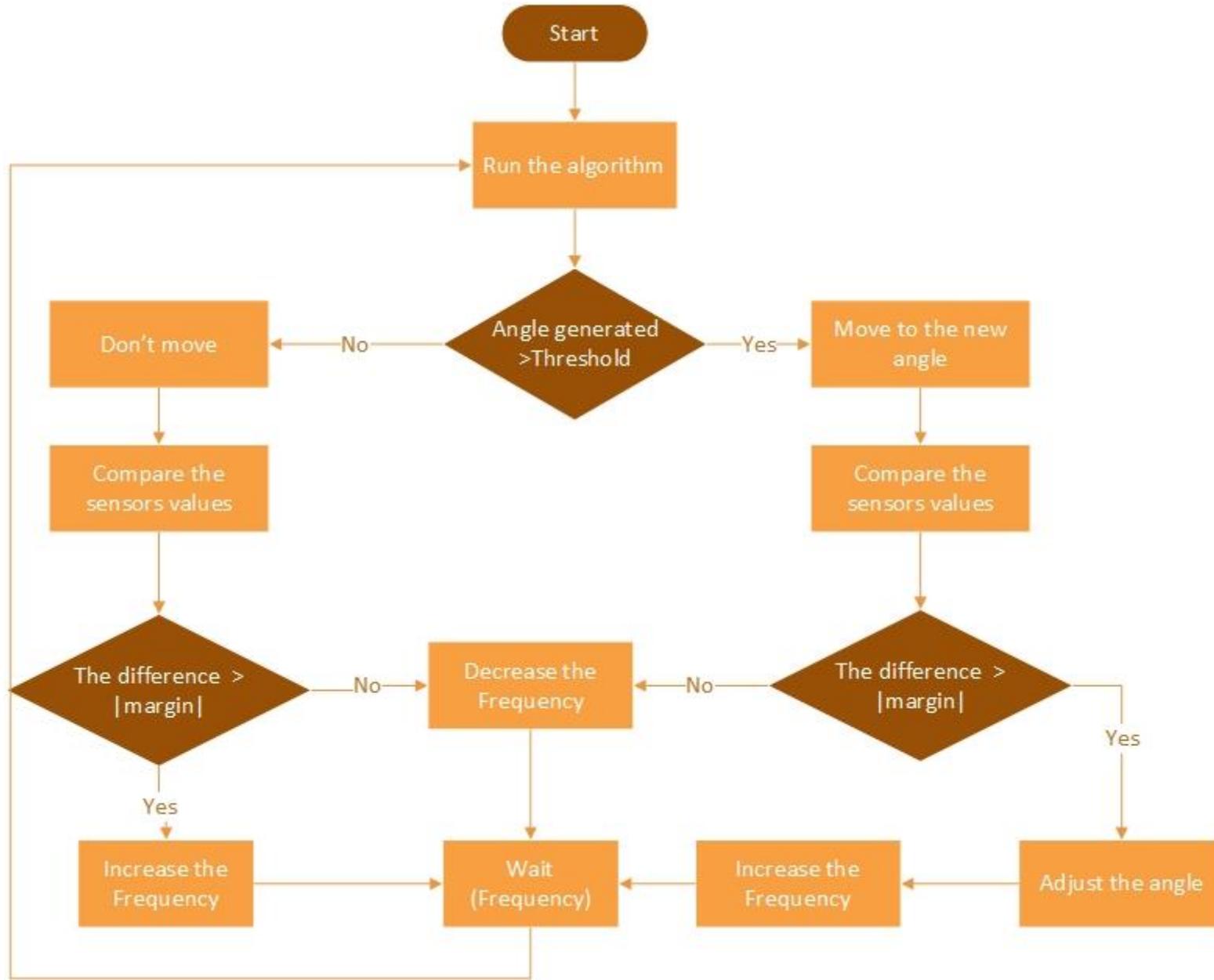
# 3<sup>RD</sup> METHOD — HYBRID (FIRST THOUGHTS)

- Combine both Algorithm and Sensors
- Use both in the same time (inefficient)
- The variable Frequency
- Introduce the idea of correction



# 3<sup>RD</sup> METHOD — HYBRID (FREQUENCY)

- Frequency & Margin
- The last idea of hybrid





# DESIGN DECISION

- Servo versus stepper.
- FPGA versus Microcontroller
- Arm-based versus Arduino



# TESTING & ANALYSIS

- Testing methodology
- Why out sourcing ?



QUESTION?

أَسْئَلَةٌ؟

THANK YOU FOR LISTING

شكرا للإستماعكم