# OFFSHORE WIND TURBINE

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**Team #12**

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# OUTLINE

- Scope
- Fall Semester Highlights
- Recent Progress
- Future Work Plans

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# SCOPE

- Objectives
  - Reduce the cost
    - Autonomous navigation
    - Twin tower design
    - Dry-dock construction
- Background
  - Potential energy production
  - Growing industry
  - Costs of offshore v. land-based

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JASON DAVIS

# BRIEF FALL SEMESTER HIGHLIGHTS

- Determination of largest cost drivers
  - Foundations
  - Construction
- Design Innovations
  - Twin tower design
  - Autonomy

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NICHOLAS SMITH

# RECENT PROGRESS

- "Mimic" several functions of full scale design
  - Separated into parts
- Anchor analysis
- Testing criteria

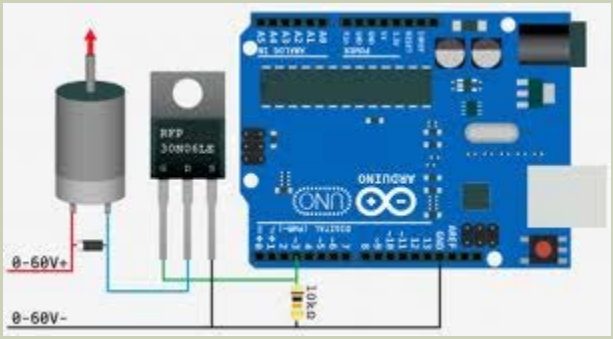
# POTENTIAL CHALLENGES

- Levels of difficulty
  - Basic (propulsion, generation, stationary)
  - Advanced (sensors, gps, etc.)
- Scaling limitations
- Assumptions
- Error

NICHOLAS SMITH

# STATUS OF PROCUREMENT

- ON SCHEDULE!
- Simple materials found at local stores
  - Hardware
  - Hobby

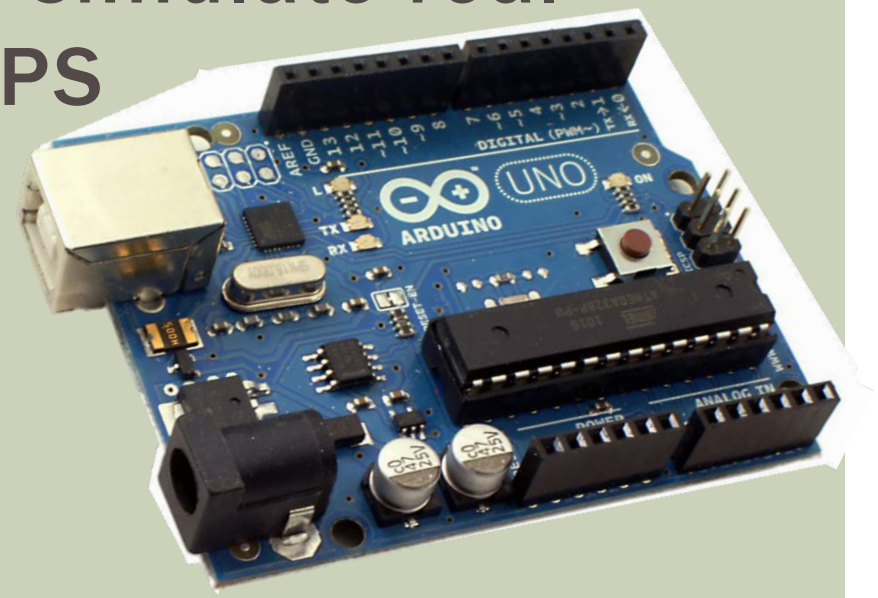


# RELEVANT DATA AND ANALYSIS

1. Autonomy-Static Location
2. Serviceability and Rotation Limit
3. Efficiency of Electricity Generated

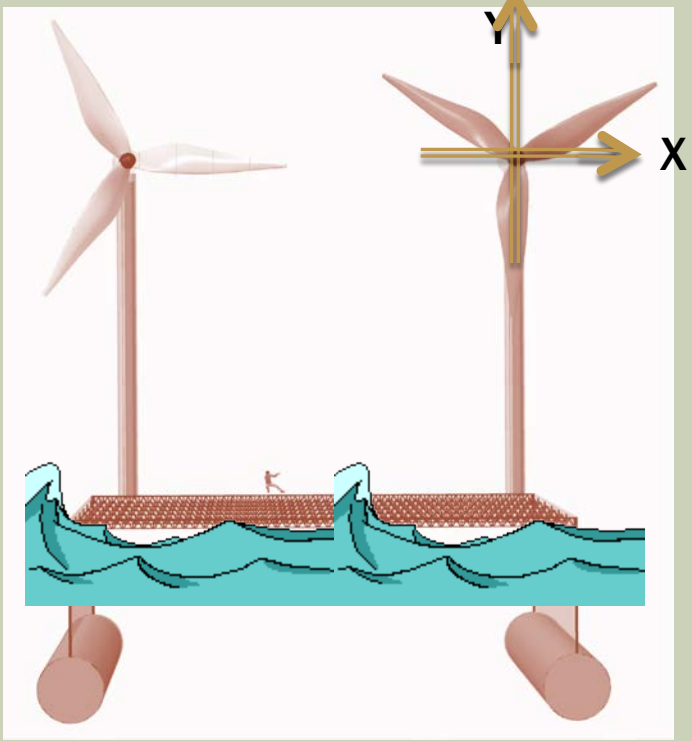
# 1. AUTONOMY: BASIC PRINCIPLES AND COMPONENTS

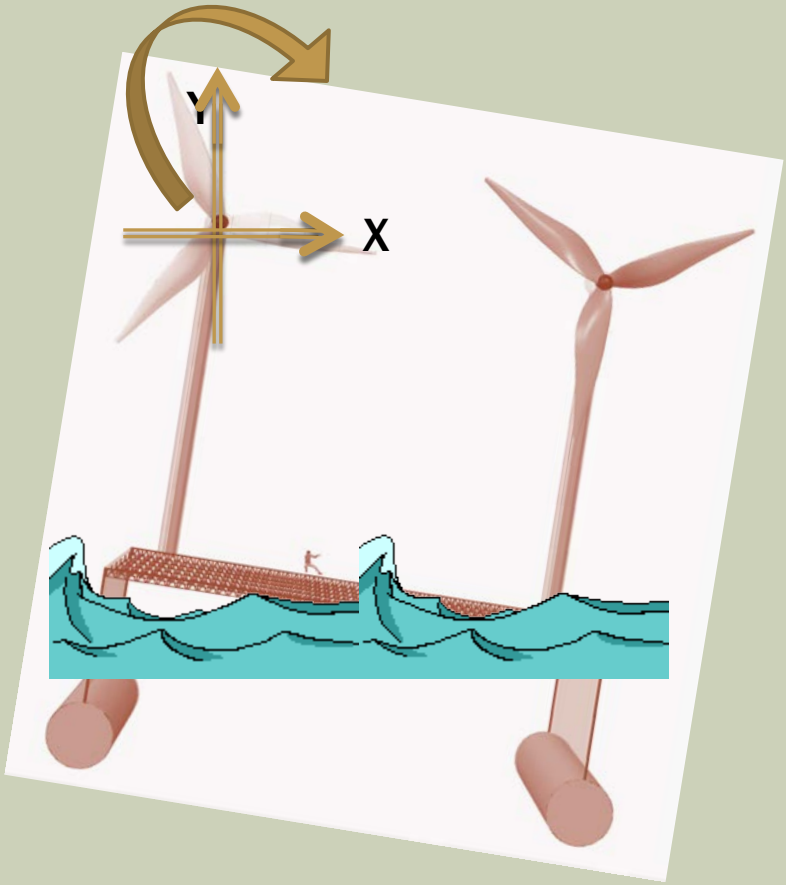
- Autonomy is by far our biggest contributor to industry
- Using Arduino to control motors
- Using timing delays to simulate real world application of GPS



MARGARET GIDULA

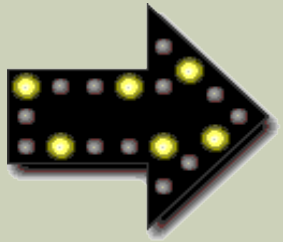
# 2. SERVICEABILITY AND ROTATION LIMIT



# SERVICEABILITY AND ROTATION LIMIT

- Assume Rigid Body
- Measured from top of tower to water level
- Our wind turbine will not tilt more than 10°



SIGNIFICANTLY GREATER THAN CODE, WHY?

- No code exists for floating turbines
- Floating allows for more flexibility

# 3. POWER EFFICIENCY

- After construction of the prototype we will be measuring efficiency of Land vs Sea
- Basic objective is to make power
- Output on sea as close to equal as possible

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# CONCLUSIONS

- Biggest contributor to market is Autonomy
- Our three factors of focus are:
  - Efficiency
  - Deflection Limit
  - Stationary Location Radius

STEPHEN DAVIS

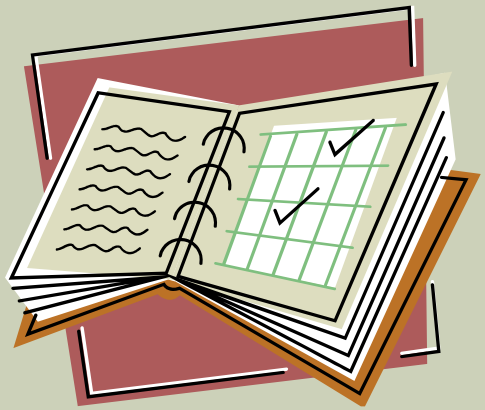
# FUTURE WORK PLANS

- Assembly & Programming
- Testing & Modeling
- Final Procurement

STEPHEN DAVIS

# FUTURE WORK PLANS

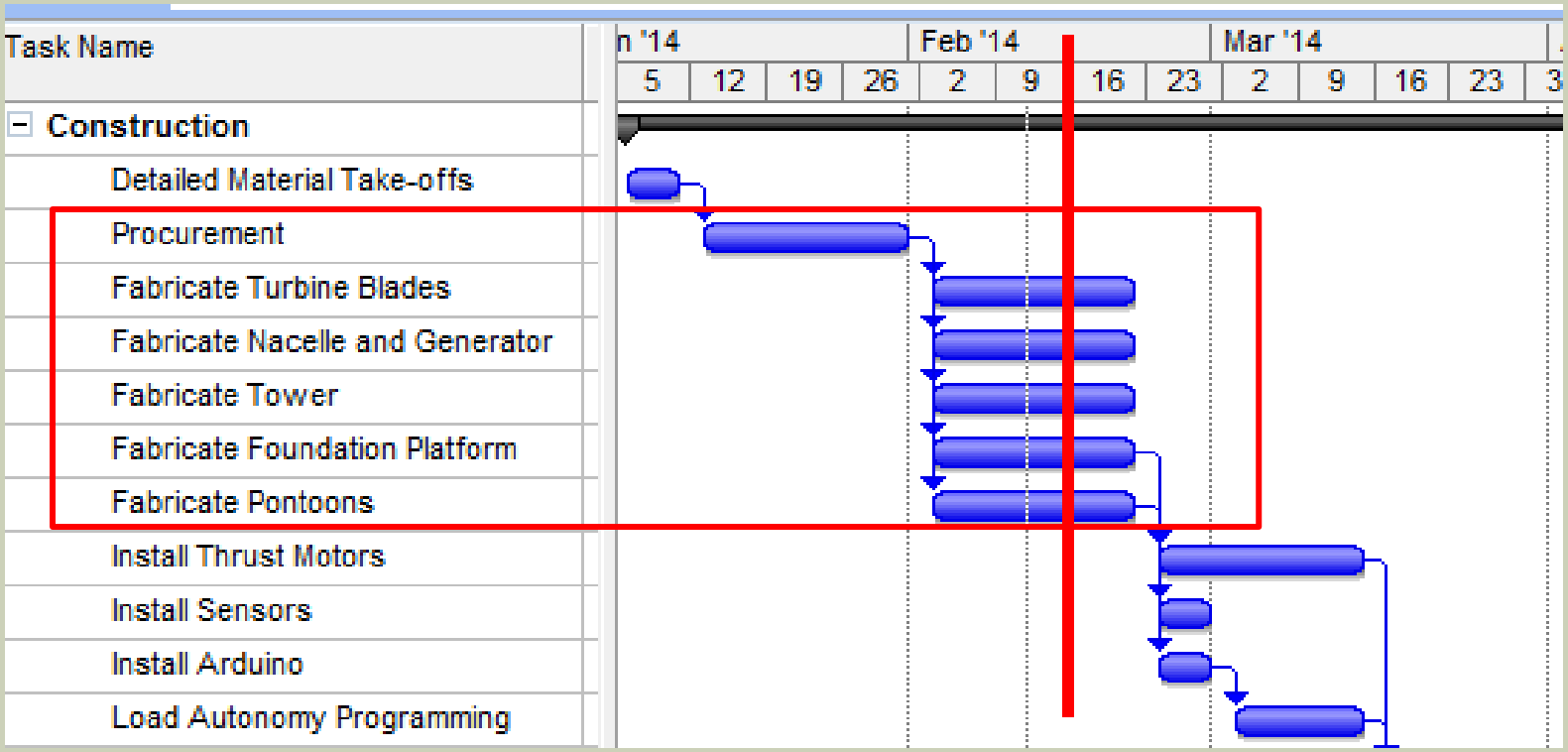
- Overall on schedule
- Programming is almost complete just
- Waiting on parts to test
- Parts should be in by the end of the week
- Construction will begin next week



JASON DAVIS

# FUTURE WORK PLANS

- Schedule & Gantt Chart
  - About 1 week behind schedule
  - 75% under budget



# THANK YOU

- QUESTIONS?