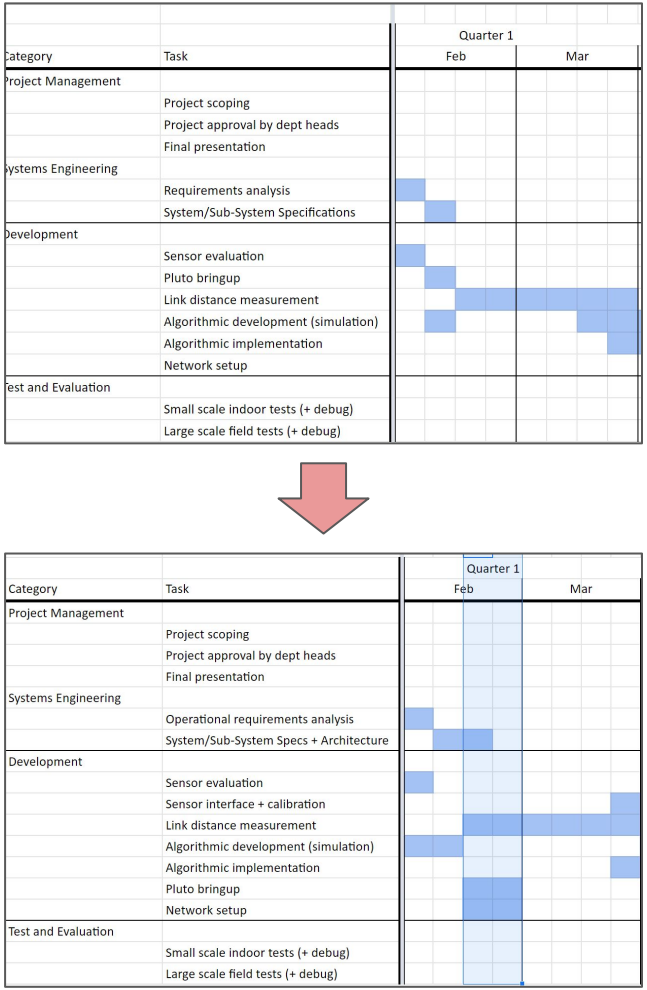
Progress Update
2/18

Schedule review

- Previous 2 weeks:
  - Algorithm selection + testing took longer than expected
    - Did build relatively robust simulation environment, so finished some work scheduled for late March
  - Specs 80% done, need to be finalized
  - 0 work done on Plutos
- Coming 2 weeks:
  - Finalize (document) specs/architecture
  - Get Pluto testbed up in simple network
  - Start link distance experimentation



		Quarter 1	
Category	Task	Feb	Mar
Project Management			
	Project scoping		
	Project approval by dept heads		
	Final presentation		
Systems Engineering			
	Requirements analysis		
	System/Sub-System Specifications		
Development			
	Sensor evaluation		
	Pluto bringup		
	Link distance measurement		
	Algorithmic development (simulation)		
	Algorithmic implementation		
	Network setup		
Test and Evaluation			
	Small scale indoor tests (+ debug)		
	Large scale field tests (+ debug)		

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	Sensor interface + calibration		
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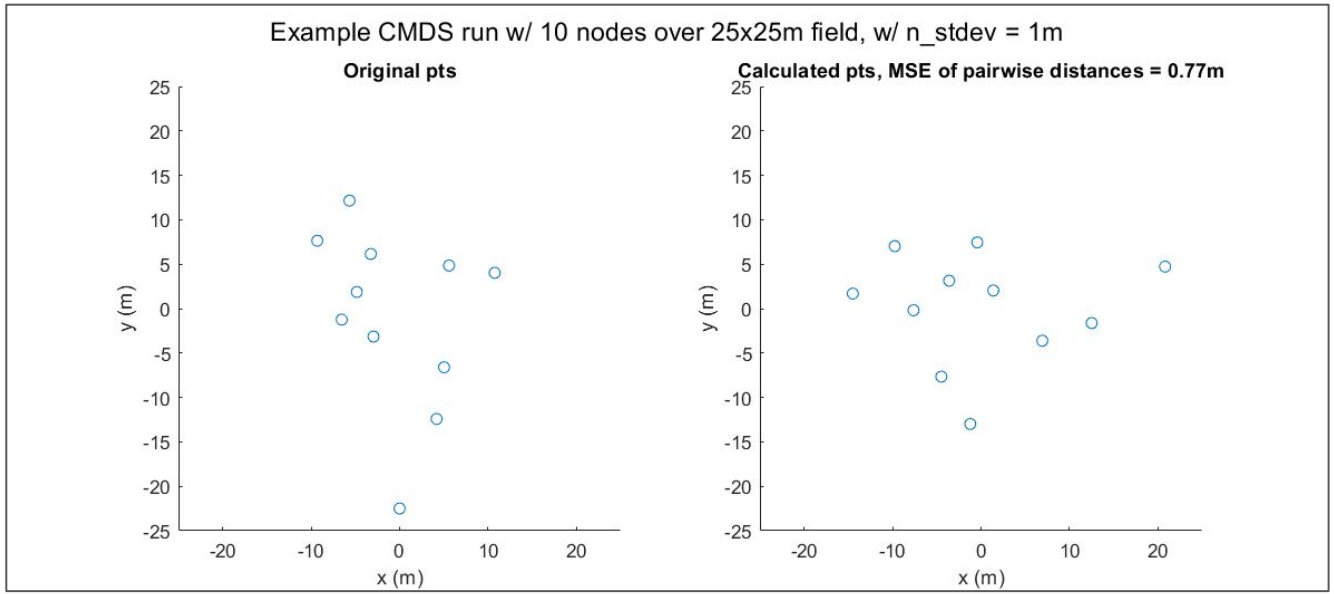
Algorithm evaluation

- Assumptions:
  - Num nodes between 3 and 10, static
  - Distance between nodes between 3 and 30 meters
  - Link measurements ±3 meters
- Options evaluated:
  - SNLSDPclique (Sensor Network Localization Semi-Definite Programming via cliques)
    - Designed for this problem
    - Optimized for 1000s of nodes - doesn't scale well down to our small scales
    - Very involved math - may be difficult to port/optimize/accelerate
  - MDS (multidimensional scaling)
    - Usually used for visualizations in polls (higher dimensional data → 2d visuals)
    - Scales down to fewer nodes much more gracefully
    - Relatively simpler math
- Moving forward with MDS, set up simulation environment to begin testing various test cases

Algorithm evaluation cont'd

- Example MDS output below:



- Shape retained, though inversion/rotation require human-in-the-loop
- Noisy link measurement of ±1m (so 99.7% < 3m) causes manageable MSE
  - So target goal of link accuracy is maximum 3 m error