Milestone Three

FLORIDA TECH IGVC

Milestone 3 Matrix

#	Task	Percentage	Will	Adam	Chris	Brent	To Do
1	Finished GUI	30	15	15	0	70	none
2	Optimized Navigation Algorithm	70	0	30	0	70	Improve time
3	RabbitMQ Clients for each software component	80	100	0	0	0	Motor control
4	Finished Line Following	90	0	0	100	0	Shading
5	LIDAR Integration	**	25	0	75	0	none
6	IOP Test Client	20	0	100	0	0	Understand documents
7	IOP Nav Platform	20	0	100	0	0	Understand documents
8	Control Component	20	50	50	0	0	Fill in states
9	Integration Testing MQ Clients and IOP	50	50	50	0	0	In progress
10	Integration Testing Components	50	25	25	25	25	Finish compone

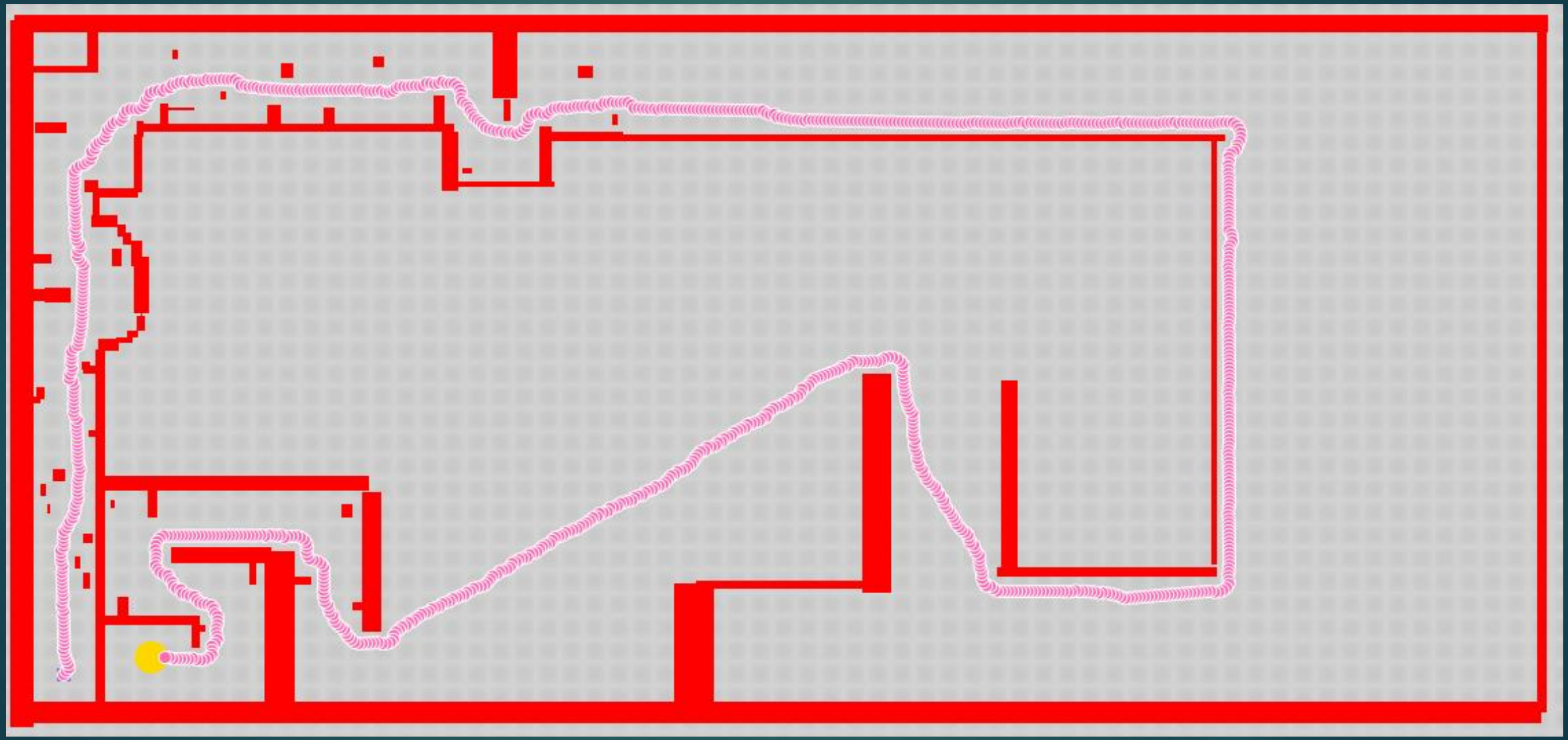
Navigation

- Focus on understanding:
  - Impact of parameters on time / space complexity
    - Branching Factor
    - Vehicle Size
    - Time Step
  - Space complexity of map usage

Navigation

- Findings:
  - Parameter: Branch factor
    - Affects runtime linearly
  - Parameter: Vehicle size
    - Affects map representation size quadratically
  - Parameter: Time Step
    - Doesn't really matter, except that optimal values increase accuracy
  - Anticipated (complete) map representation size: ~5 megabytes
    - Not worth spending time optimizing
  - Increased map resolution bogs down runtime
    - Halving a map's resolution cut runtime from ~9.5 to ~1.5 seconds!

Navigation: 1200x600 (and 600x300)



Navigation: Future Work

- Understand, integrate LPA* algorithm to shorten re-compute time
- Determine optimal parameters to keep runtime low

Vision

- Edge detection in various lighting conditions at various angles
- Issues
  - Shading
- TODO
  - Background deletion
  - Luminescence calculations
  - Polarizing lenses

Communication

- C++ multi-threaded communication client for GPS
- All individual Java RabbitMQ communication clients created
- Helped FSU design their software components
- Issues
  - There is a bug in the C++ AMQP library regarding publishing and receiving messages in the same thread

IOP

- Purchased three documents
- Have RelaxNG XML Schema for all 8 core services
  - Need to translate into usable Java code
  - Attempted using RelaxNGCC, however getting errors for unknown reasons
- Looking at using JAUS Toolset as an alternative
  - http://jaustoolset.org/

Milestone 4 Matrix

#	Task	Will	Adam	Chris	Brent
1	Finish Navigation	15	15	0	70
2	Standardize Message Formats	25	25	25	25
3	Vision & Motor Control RabbitMQ Clients	100	0	0	0
4	Line recognition and Obstacle recognition	0	0	100	0
5	Help FSU develop software	40	10	40	10
6	IOP Test Client	0	100	0	0
7	IOP Nav Platform	0	100	0	0
8	Control Component	33	33	0	33
9	Integrating Components and Integration Testing Components	25	25	25	25