



Carnegie
Mellon
University

Patrol Knight

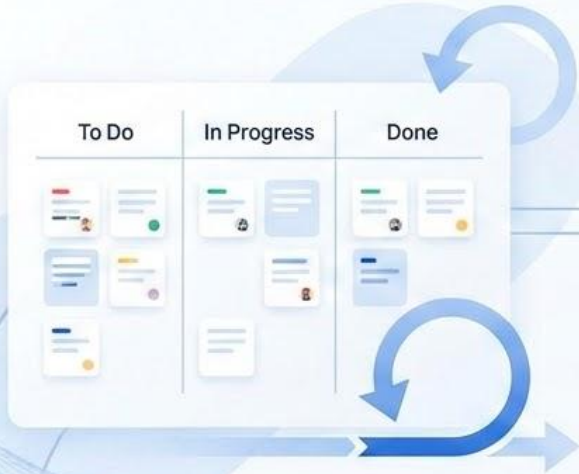
Methodology Presentation

Team E

Sam Dong, Po-Ting Ko, Joshua Tsai, Pin-Wen Wang, Leo Xu

Agenda – Part 1: Methodology

Method: Scrum



Project Management Tool:



Code Base Management Tool:

Bitassian management and starter project.



Starting With Creating Tickets in Backlog

Spaces / K7V1 Scrum Board

K7V1 board

Summary Timeline **Backlog** Active sprints Calendar Reports List Forms Goals All work More 9+

Q Search backlog SD AT BM CX CW +9 Version Epic Type Quick filters

>	K7V1-248	Collision-Free map converter	CMU PATROLNIGHT	UNDER REVIEW	10	
	K7V1-265	Raptor VCU Flashing & Calibration Setup Proposal	K7 AP ACM PHASE 2	IN PROGRESS	6	
	K7V1-295	StopAgg: Human Stop Implementation		TO DO	6	
	K7V1-296	StopAgg: Machine Stop Implementation		BACKLOG	-	
	K7V1-304	StopAgg: Ignore Stop Implementation		BACKLOG	-	
	K7V1-305	Implement Automated Runtime Hours Logging for ACM St...	K7 AP ACM PHASE 2	UNDER REVIEW	8	
	K7V1-309	Run Alpha2 In Loops	K7 AP ACM PHASE 2	IN PROGRESS	2	
>	K7V1-311	F1TENTH Integration	CMU PATROLNIGHT	TO DO	37	
	K7V1-326	Object Detection	CMU PATROLNIGHT	BACKLOG	-	
☐	>	K7V1-320	Spring Testing Plan Proposal	CMU PATROLNIGHT	IN PROGRESS	5
>	K7V1-312	F1Tenth Simulation Setup	CMU PATROLNIGHT	TO DO	8	
	K7V1-278	Integrate health_battery into health monitoring package	K7 AP ACM PHASE 2	BACKLOG	4	
	K7V1-227	Phase 5: Implement docking recovery mechanism with re...	K7 DOCKING AP	BACKLOG	6	
	K7V1-333	Phase 3: Testbench testing of Docking State Machine and...	K7 DOCKING AP	BACKLOG	4	
	K7V1-334	Phase 3: Review Docking State Machine and Architecture	K7 DOCKING AP	BACKLOG	1	
	K7V1-337	Diagnose Frequent IPC Crashes	K7 AP ACM PHASE 2	IN PROGRESS	5	
	K7V1-338	Onboarding - documentation on ACM	K7 AP ACM PHASE 2	IN PROGRESS		

Quickstart

Subtasks

Point scale

- 1–2 pts: Small change (2–4 hrs), low risk
- 3 pts: ~1 day, clear & well-defined
- 5 pts: ~2–2.5 days, moderate complexity
- 8 pts: ~4 days, high complexity / multiple components
- 10 pts: ~5 days (max). Anything bigger --> must be split

The screenshot shows a Jira issue page for K7V1-251. The 'Subtasks' section lists several tasks, all marked as 'DONE'. The task 'Test 2 - ROS 2 Node Integration' (K7V1-245) is highlighted. A blue arrow points from this task to the 'Story Points' field in the 'Details' sidebar, which is currently set to 17.

Work	Pri...	Stor...	As...	Status
K7V1-242 Design pure-pursuit controller algorithm	M	2	SD	DONE
K7V1-243 Implement pure-pursuit controller	M	3	SD	DONE
K7V1-247 Test 1 – Standalone Visualization	M	3	SD	DONE
K7V1-244 Convert pure-pursuit controller as a ROS2 node	M	3	SD	DONE
K7V1-245 Test 2 – ROS 2 Node Integration	M	3	SD	DONE
K7V1-246 Document pure-pursuit controller usage and integration	M	3	SD	DONE

Linked work items

is parent task of	Status	Assignee
K7V1-242 Design pure-pursuit controller algorithm	DONE	SD
K7V1-245 Test 2 – ROS 2 Node Integration	DONE	SD
K7V1-243 Implement pure-pursuit controller	DONE	SD
K7V1-247 Test 1 – Standalone Visualization	DONE	SD

Details

Assignee: SD Sam Dong

Reporter: SD Sam Dong

Development: Open with VS Code, Create branch, Create commit

Sprint: Feb16 to Feb27, ACM-Sprint 26...

Story Points: 17

Parent: K7V1-251 CMU PatrolKnight

Priority: Major

Labels: None

Original estimate: 0h

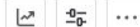


Version ▾

Epic ▾

Type ▾

Quick filters ▾



>	 K7V1-228	K7 Stopping distances analyses		K7 AP ACM PHASE 2	IN PROGRESS	4		
	 K7V1-219	Simulation Infra Setup		K7 AP ACM PHASE 2	IN PROGRESS	5		
	 K7V1-222	CICD Proposal		CI/CD	IN PROGRESS	10		
>	 K7V1-226	Implement battery monitoring and autonomous char...		K7 DOCKING AP	BACKLOG	10		
	 K7V1-223	Deployment tools- Get access to an AWS instance		K7 AP ACM PHASE 2	BACKLOG	1		
✓	 K7V1-235	Pure Pursuit Controller (Local Planning)		CMU PATROLKNIGHT	UNDER REVIEW	17		
	 K7V1-242	Design pure-pursuit controller algorithm			DONE	2		
	 K7V1-243	Implement pure-pursuit controller			DONE	3		
	 K7V1-247	Test 1 – Standalone Visualization			DONE	3		
	 K7V1-244	Convert pure-pursuit controller as a ROS2 node			DONE	3		
	 K7V1-245	Test 2 – ROS 2 Node Integration			DONE	3		
	 K7V1-246	Document pure-pursuit controller usage and integration			DONE	3		
>	 K7V1-236	Path Planning Algorithm		CMU PATROLKNIGHT	IN PROGRESS	20		
>	 K7V1-237	Implement a Simple User Interface 		CMU PATROLKNIGHT	IN PROGRESS	20		 ...
	 K7V1-240	Moving valeo_camera package triggers dependency lock ...		K7 AP ACM PHASE 2	UNDER REVIEW	4		
>	 K7V1-248	Collision-Free Map converter		CMU PATROLKNIGHT	UNDER REVIEW	16		
	 K7V1-265	Raptor VCU Flashing & Calibration Setup Proposal		K7 AP ACM PHASE 2	IN PROGRESS			

 Quickstart 



Pushed To Sprint After Meeting

Spaces / K7V1 Scrum Board

K7V1 board

Summary Timeline Backlog **Active sprints** Calendar Reports List Forms Goals All work Components Development Code Security More 9+

Search board SD BM CX CW M +5 Epic 1 Type Quick filters Clear filters

Complete sprint Group: Epic

▼ K7V1-251 CMU PatrolKnight (55 work items) TO DO

TO DO 16/16

- PR: path-planning
CMU PATROLNIGHT
K7V1-340 1 1 1 CX
- F1TENTH Integration
CMU PATROLNIGHT
K7V1-311 37 2 1 SD
- Integration System Pipeline Diagram Design
K7V1-313 3 2 1 TT
- Teleop, Mapping, and Localization Module Integration
K7V1-314 3 2 1 TT
- Teleop Module and Mapping Module Integration
K7V1-315 2 2 1 TT
- Teleop, Mapping, Localization, and UI/UX Module Integration

IN PROGRESS 9/9

- Path Planning Algorithm
CMU PATROLNIGHT
K7V1-236 20 1 1 1 1 1 M
- Edge case Handling
K7V1-280 2 1 1 1 1 M
- Integration
K7V1-282 4 1 1 1 1 M
- Implement a Simple User Interface
CMU PATROLNIGHT
K7V1-237 20 1 1 1 1 1 PK
- Performance Testing and Optimization
K7V1-276 3 1 1 1 PK
- Spring Testing Plan Proposal
CMU PATROLNIGHT

WORK COMPLETED 4/4

- K7V1-236 Path Planning Algorithm
Implement TSP algorithm for determine the visiting order of waypoints
K7V1-266 3 1 1 1 1 M
- Path Validation
K7V1-279 3 1 1 1 1 CX
- Add smoothing method to current generated paths
K7V1-268 2 1 1 1 1 M
- Testing and Visualization
K7V1-281 3 1 1 1 CX

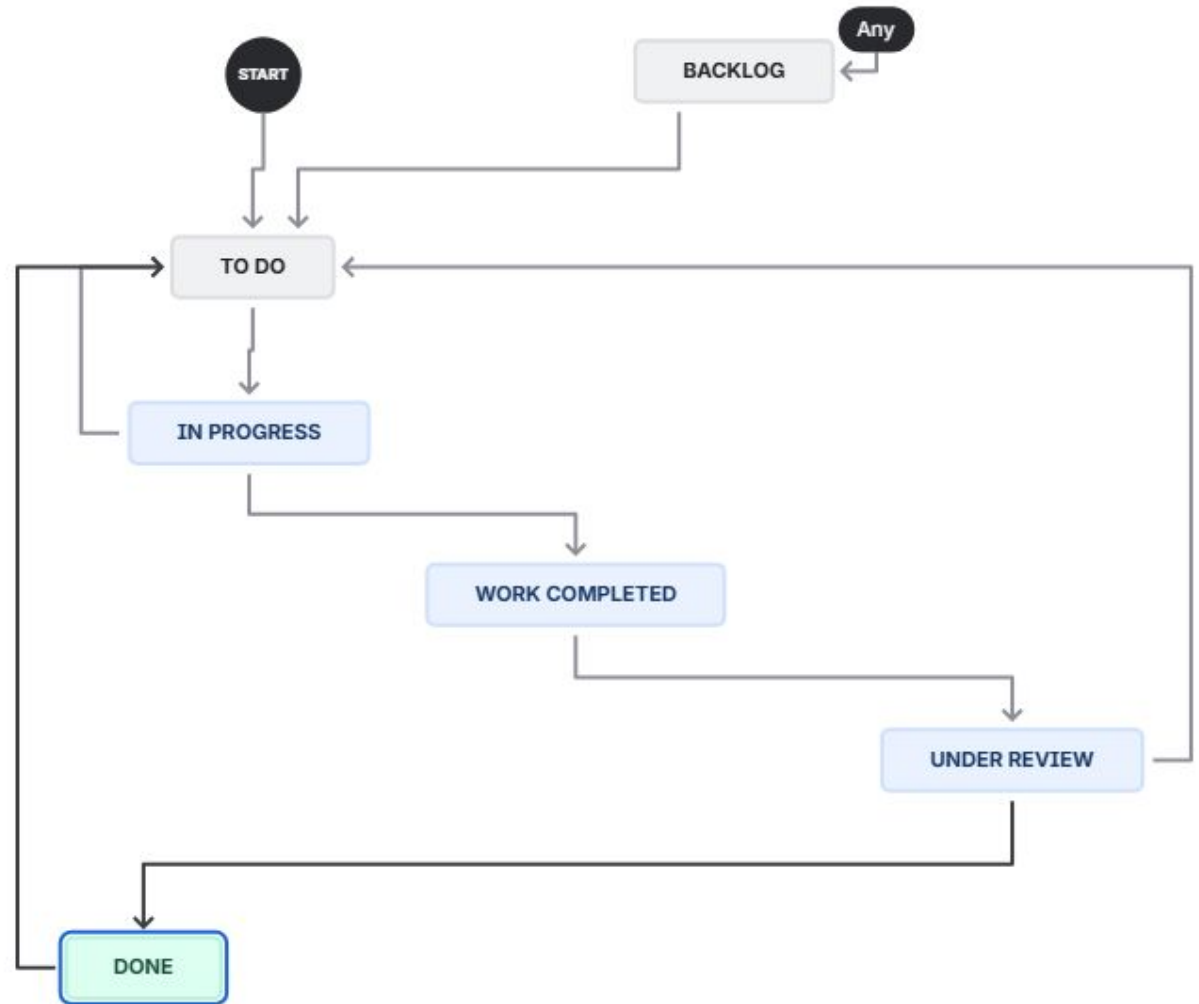
UNDER REVIEW 7/7

- Pure Pursuit Controller (Local Planning)
CMU PATROLNIGHT
K7V1-235 17 1 1 1 1 1 SD
- K7V1-237 Implement a Simple User Interface
Implement Mission Publish Functionality
K7V1-272 2 1 1 1 1 PK
- Render Subscribed Path on Map
K7V1-273 2 1 1 1 1 PK
- Add User Notifications Pop-up Window
K7V1-275 2 1 1 1 1 PK
- Collision-Free Map converter
CMU PATROLNIGHT
K7V1-248 16 1 1 1 1 1 TT

DONE 19/19

- K7V1-235 Pure Pursuit Controller (Local Planning)
Design pure-pursuit controller algorithm
K7V1-242 2 1 1 1 1 1 SD
- Implement pure-pursuit controller
K7V1-243 3 1 1 1 1 1 SD
- Test 1 – Standalone Visualization
K7V1-247 3 1 1 1 1 1 SD
- Convert pure-pursuit controller as a ROS2 node
K7V1-244 3 1 1 1 1 1 SD
- Test 2 – ROS 2 Node Integration
K7V1-245 3 1 1 1 1 1 SD
- Document pure-pursuit controller usage and integration
K7V1-246 1 1 1 1 1 1 SD

Workflow



Why Scrum

- Knightscope Requirement :P
- Adaptability
- Iterative Progress
- Team Empowerment

Challenges:

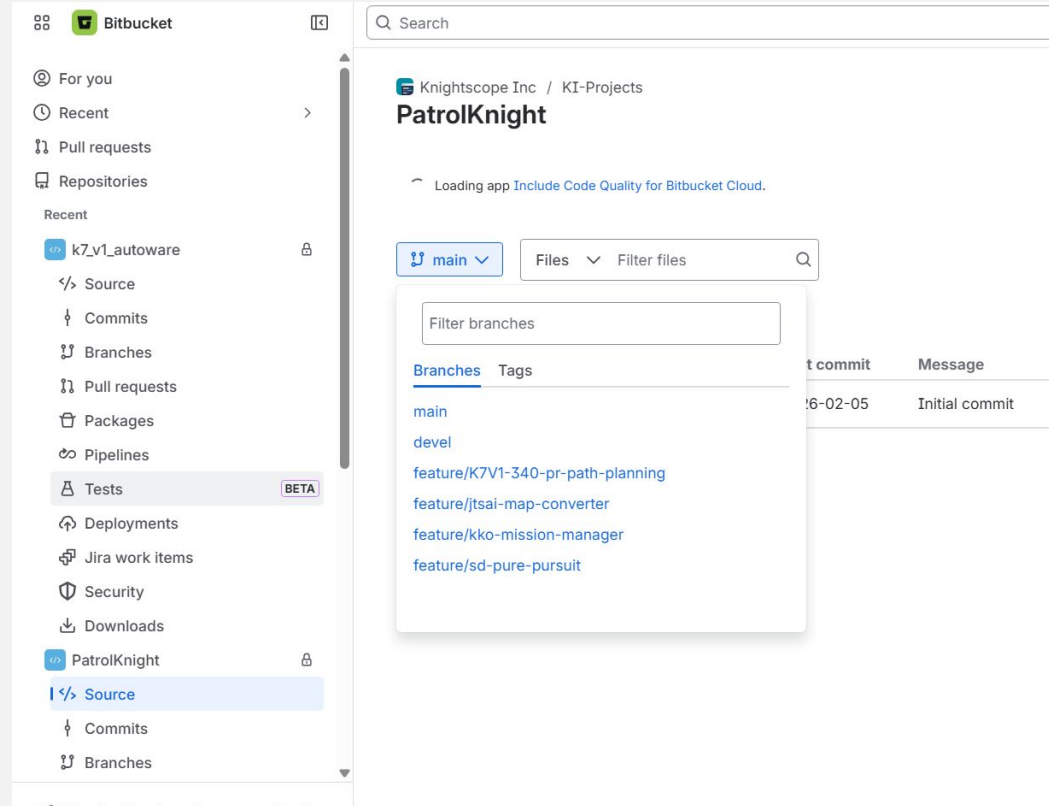
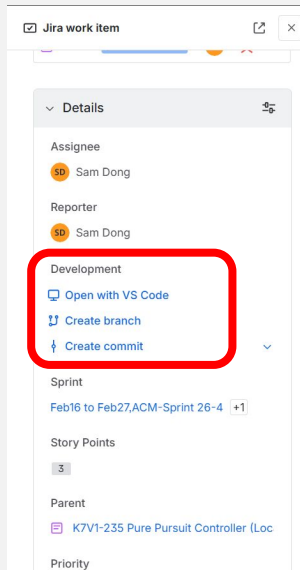
- Scope Creep
- Estimating Effort

Benefits:

- Increased Visibility
- Higher Quality
- Improved Collaboration

What to Do Differently Moving Forward

- Avoid over-promising
- Creating new branch on Jira instead of CLI



Agenda – Part 2: Stand-Up Meeting

Meetings with Sponsor

- Twice a week
- On zoom
- 30 mins meeting
- Every member update their ticket
- Value: Keep our sponsors updated & understand what other teammates are doing

Internal Meeting

- No set time, in avg twice a week
- 1-2h long each
- All members show up 70%
- Discussion between interrelated submodules

