4K450
Embedded Motion Control

Final Presentation

Group 11

Technische Universiteit
Eindhoven
University of Technology

Where innovation starts

Content

- **Overview: Goal achieved?**
- **What we learned in the last eight weeks?**
- **Future: What can be solved better?**

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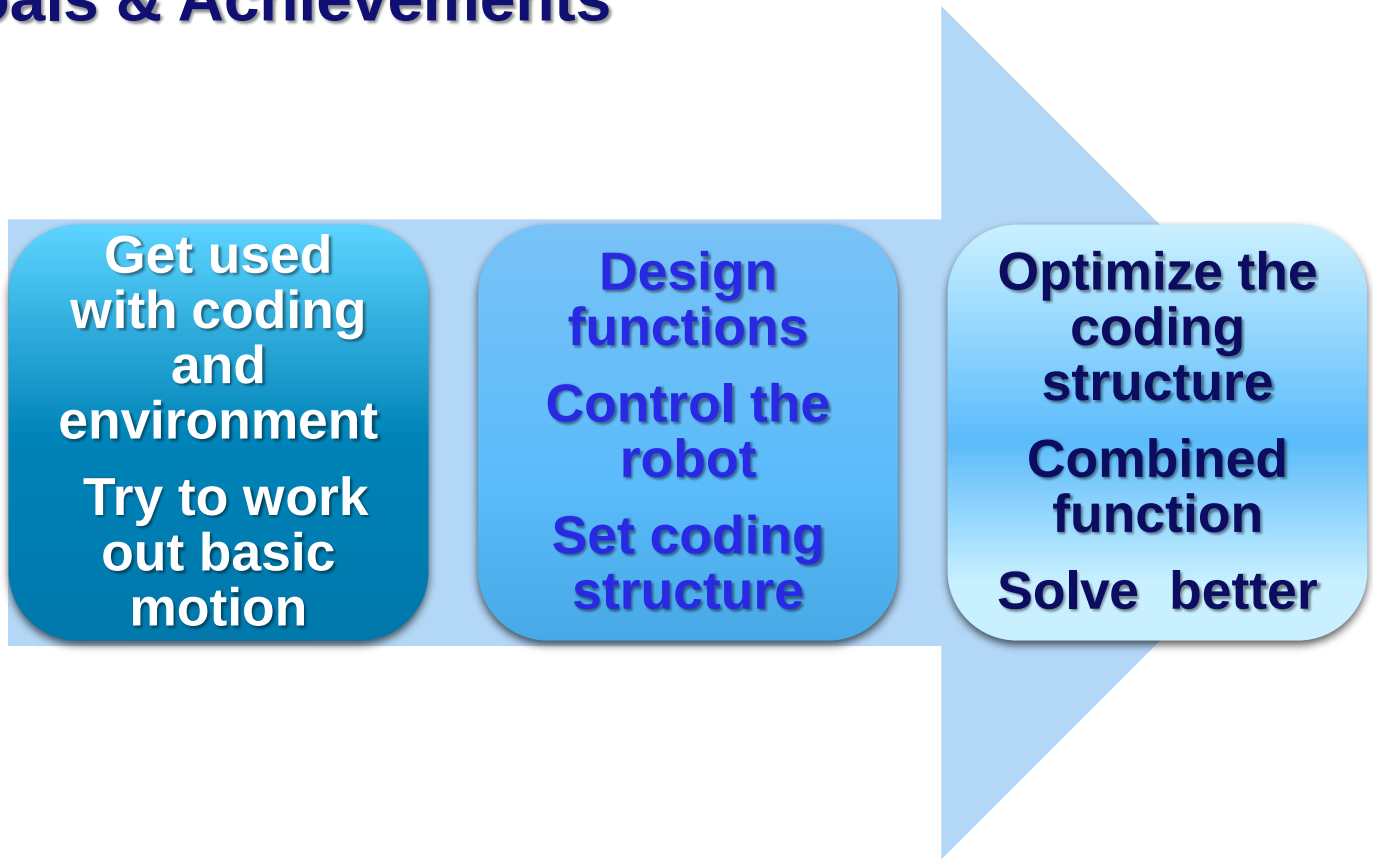
Overview

- **Goals & Achievements**



What we learned in the last eight weeks ?

- 5Cs (Composition patterns)
- Nonlinear Control
- C++ programming
- Maze solving algorithm

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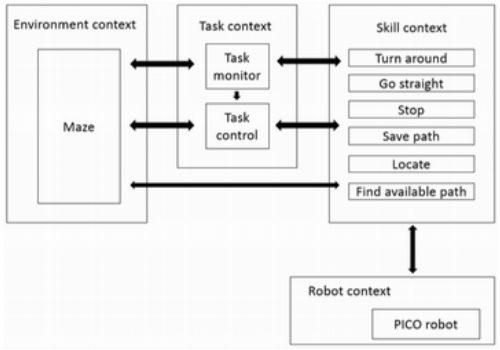
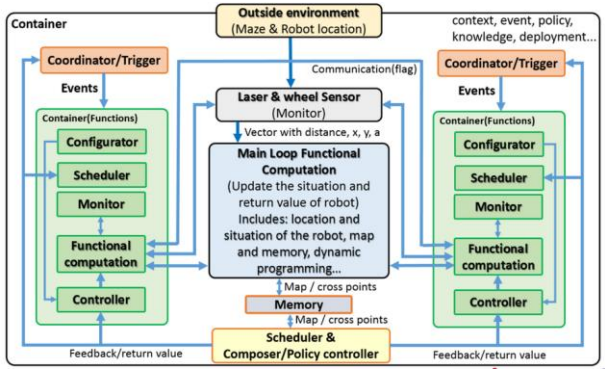
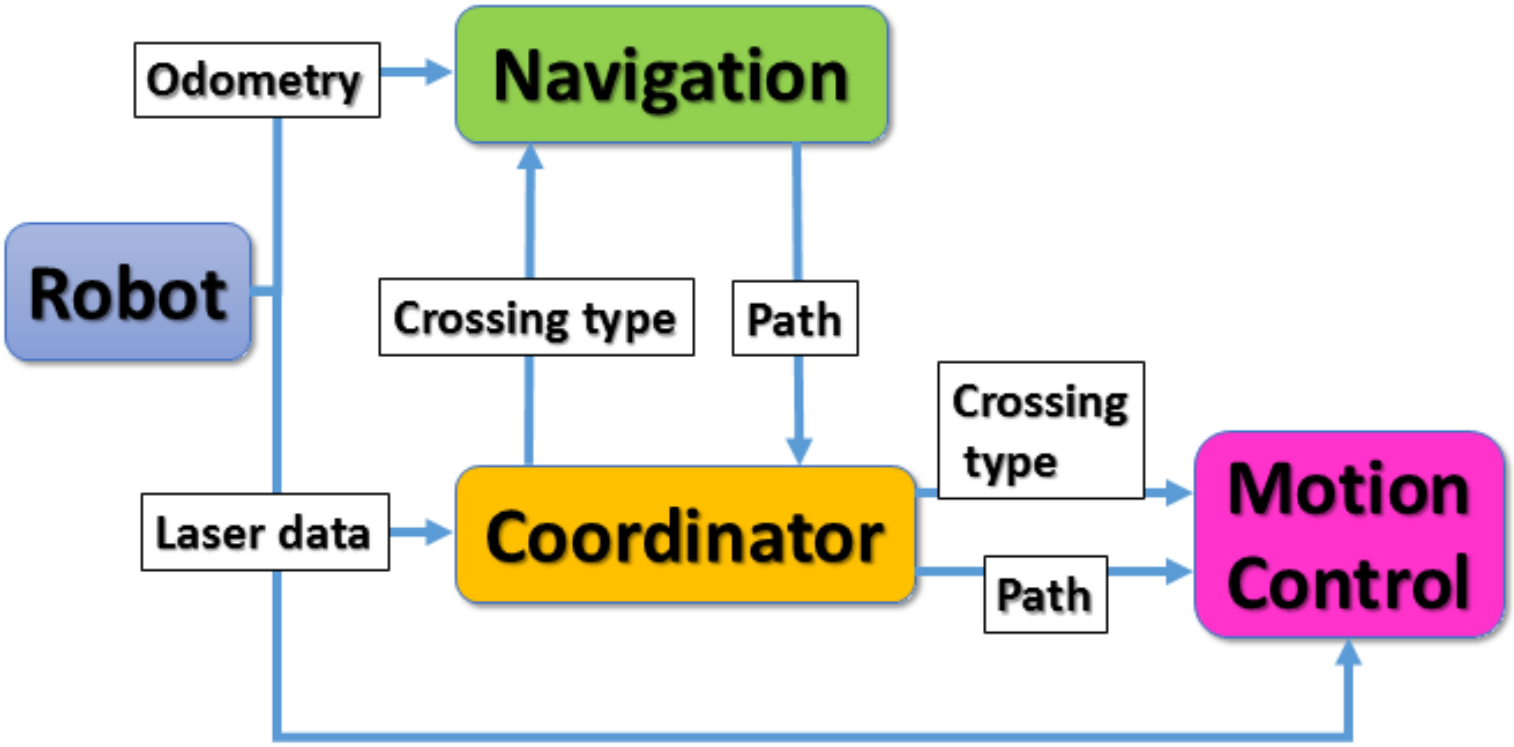
Composition Pattern

- **Make the structure of the composition pattern simpler**
- **Better and clear hierarchy**
- **Combined function**

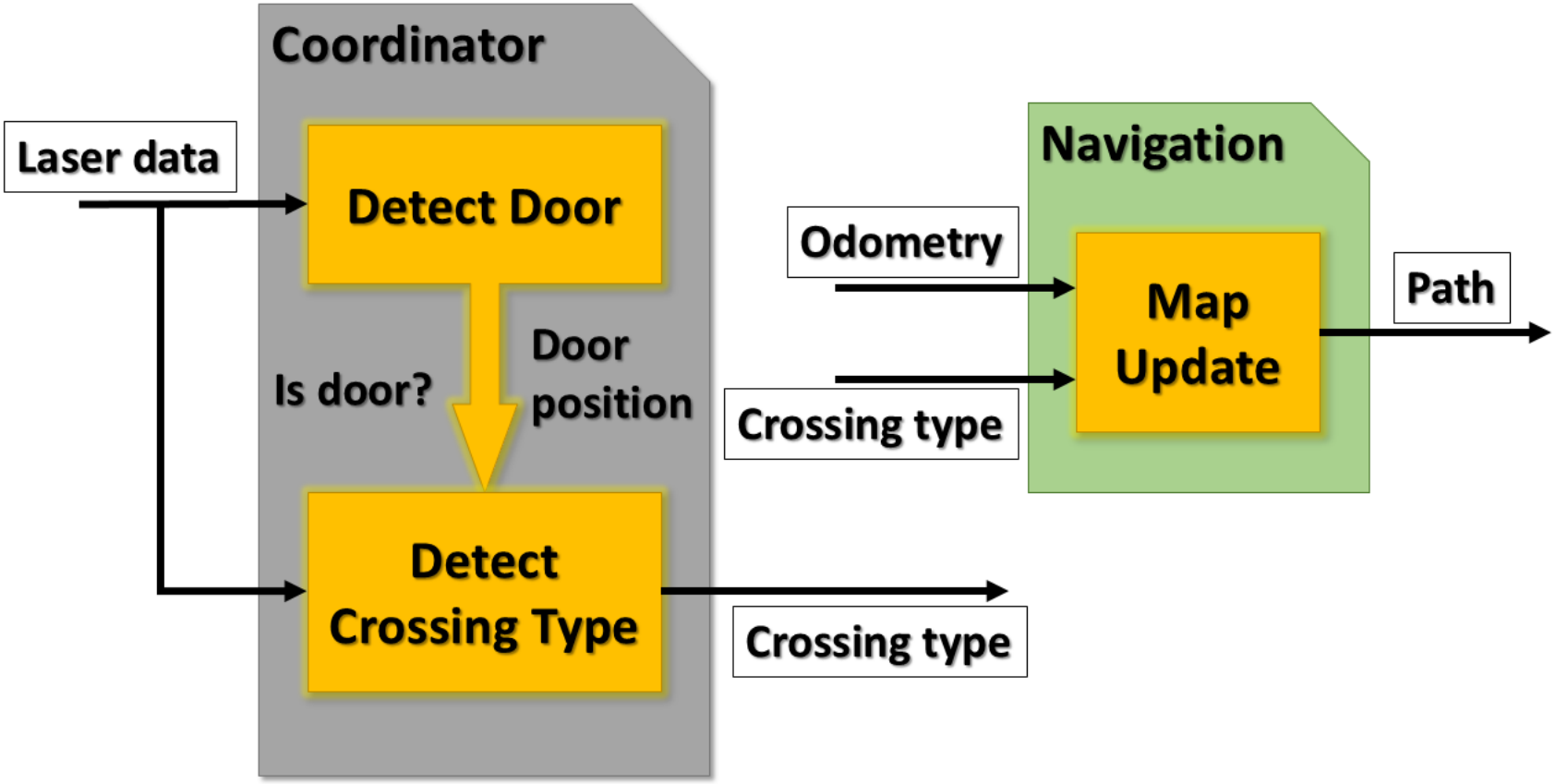




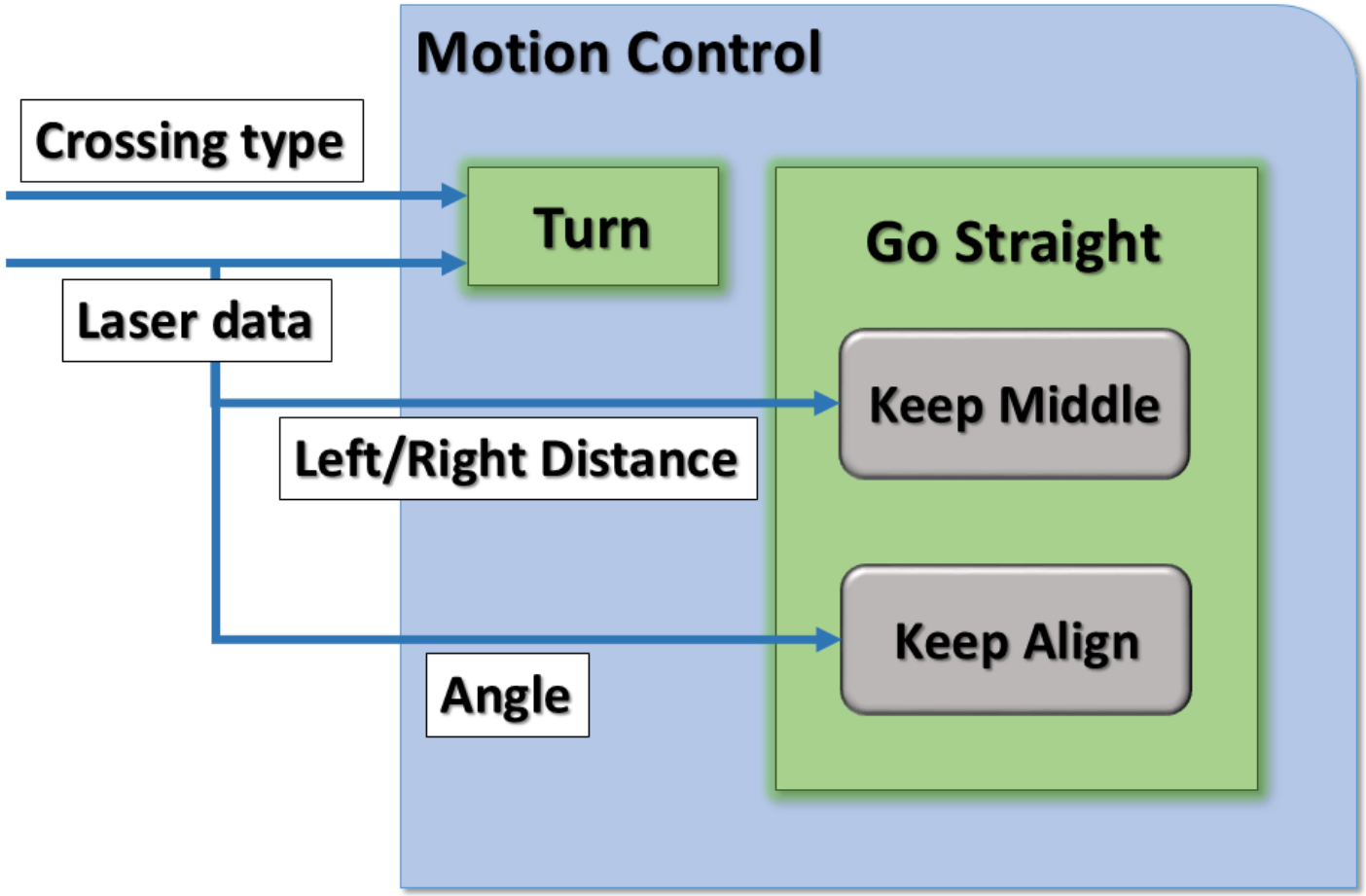
Composition Pattern – System Level



Composition Pattern – Coordinator & Navigation

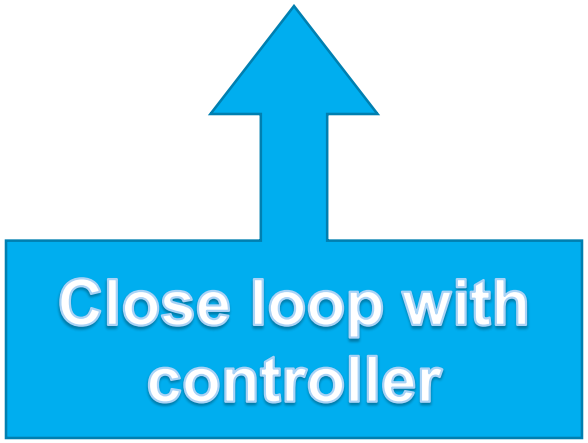


Composition Pattern – Motion control

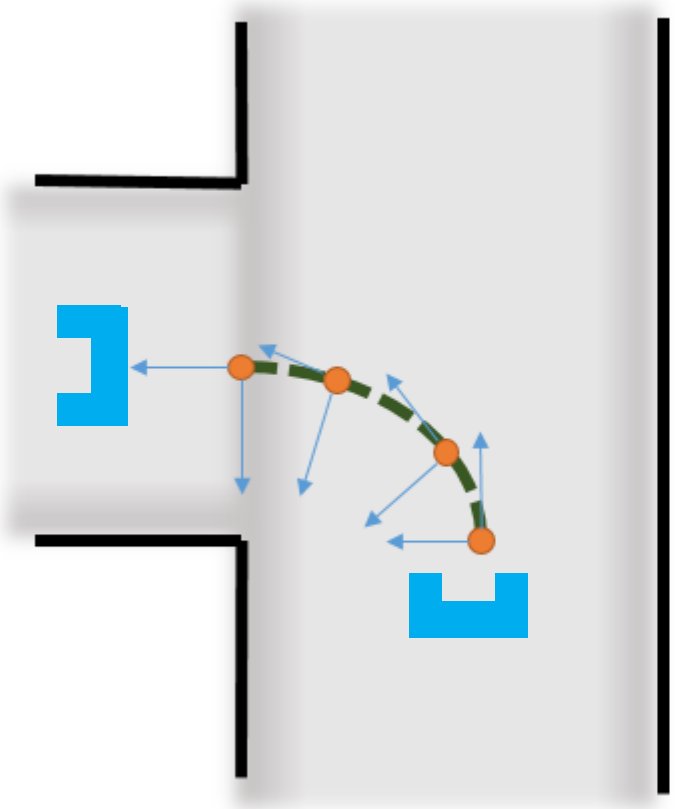


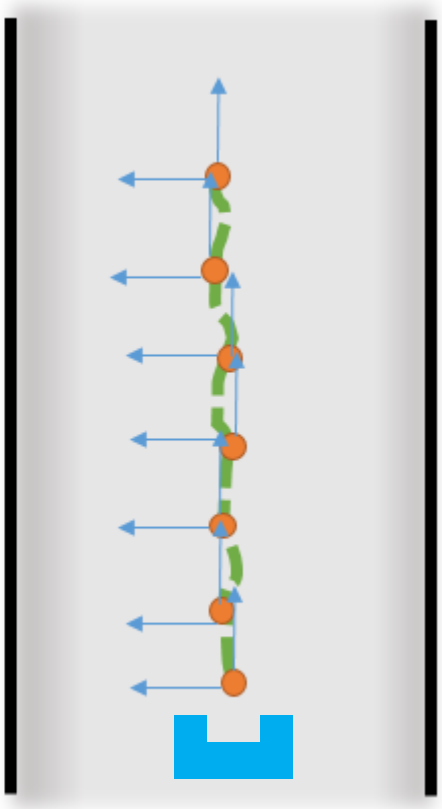
Nonlinear Control

- **Ellipse Track Control**
- **Situation / Align Control**



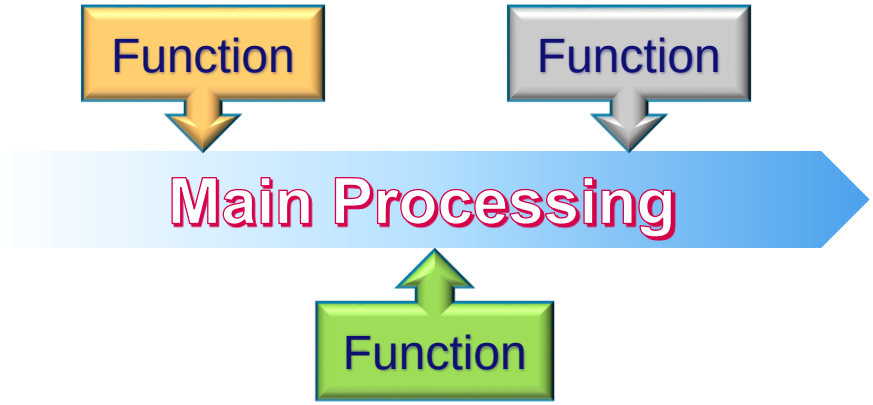
Nonlinear Control





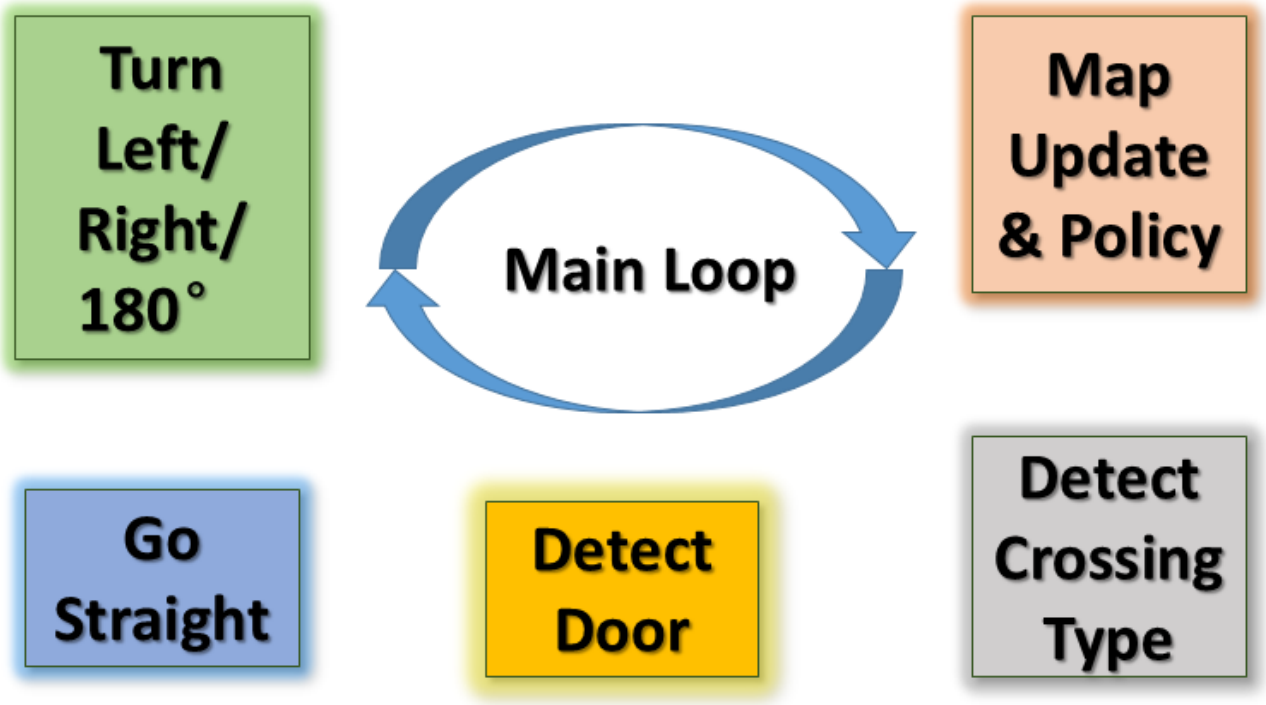
C++ Programming

- **Programming Structure**
- **Functions**



C++ Programming

- **Combined 10 functions into 5 Modules**

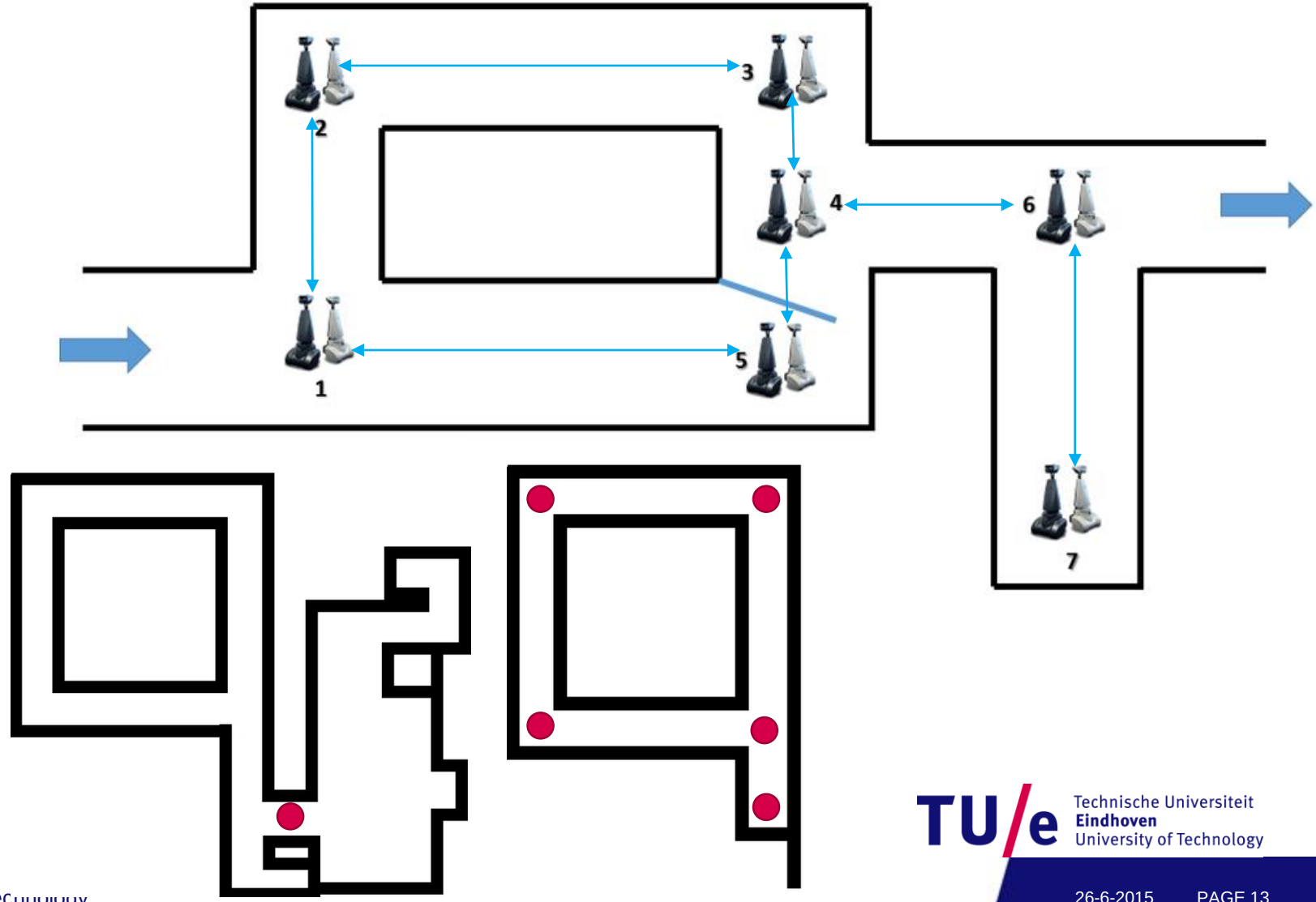


Maze solving algorithm

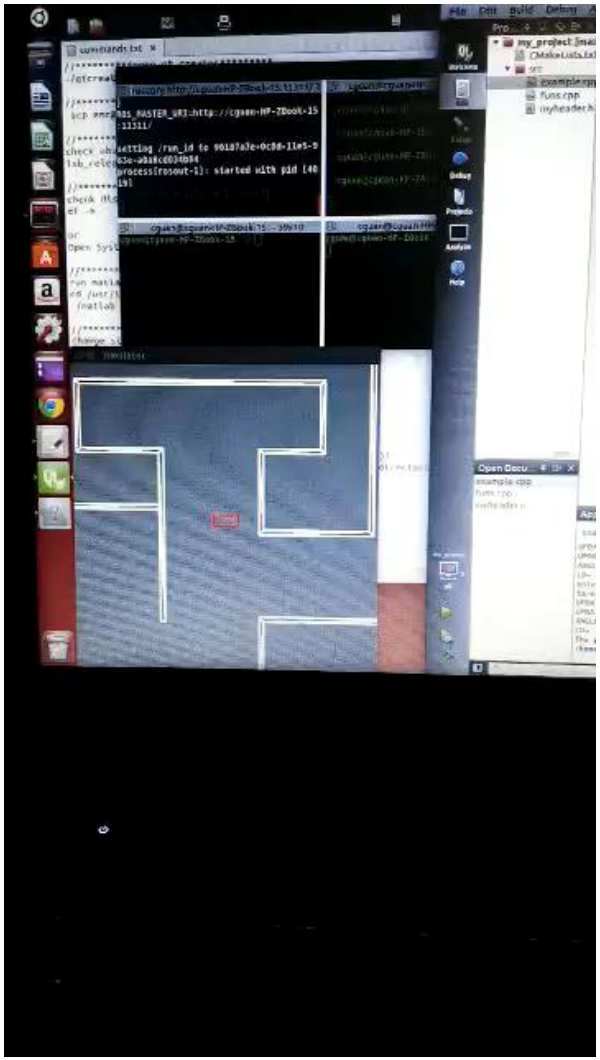
- **Memory the Map & Better “Right Hand Rule”**

Algorithm	Dead End %	Type	Focus	Bias Free?	Uniform?	Memory	Time	Solution %
Unicursal	0	Tree	Wall	Yes	never	N^2	379	100.0
Recursive Backtracker	10	Tree	Passage	Yes	never	N^2	27	19.0
Hunt and Kill	11 (21)	Tree	Passage	no	never	0	100 (143)	9.5 (3.9)
Recursive Division	23	Tree	Wall	Yes	never	N	10	7.2
Binary Tree	25	Set	Either	no	never	0*	10	2.0
Sidewinder	27	Set	Either	no	never	0*	12	2.6
Eller's Algorithm	28	Set	Either	no	no	N*	20	4.2 (3.2)
Wilson's Algorithm	29	Tree	Either	Yes	Yes	N^2	48 (25)	4.5
Aldous-Broder Algorithm	29	Tree	Either	Yes	Yes	0	279 (208)	4.5
Kruskal's Algorithm	30	Set	Either	Yes	no	N^2	33	4.1
Prim's Algorithm (true)	30	Tree	Either	Yes	no	N^2	160	4.1
Prim's Algorithm (simplified)	32	Tree	Either	Yes	no	N^2	59	2.3
Prim's Algorithm (modified)	36 (31)	Tree	Either	Yes	no	N^2	30	2.3
Growing Tree	49 (39)	Tree	Either	Yes	no	N^2	48	11.0

Maze solving algorithm



Maze solving algorithm



Future: What can be solved better?

- **Faster solution of the maze**
- **Better robustness**
- **More efficiency communication**
- **Memory and data models management**

Thank you!

Special thanks to all group members!

Any questions?

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