
University of Glasgow
VIA VERITAS VITA
Robotics Team Design Project M
Simulated RoboCup Soccer Teams
WORLD CHANGERS WELCOME

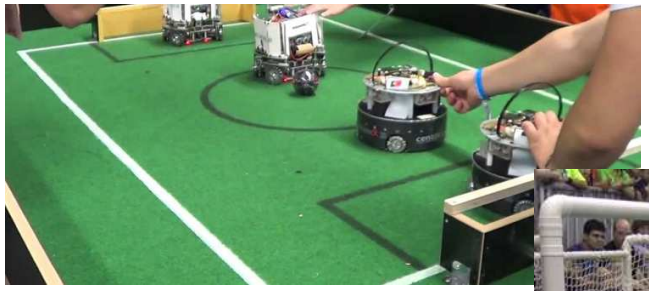
Staff

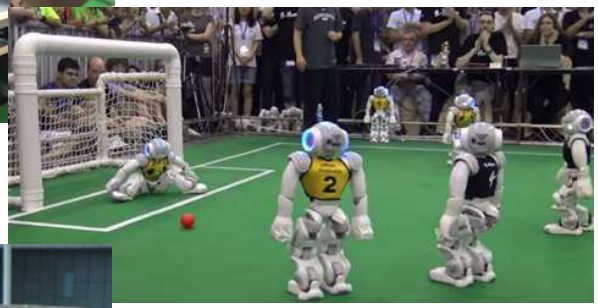
- **Lecturer**: Dr Euan M^{c}Gookin
- **Office:** Rm 722 James Watt Building (South)
- **Ext:** 6023
- **E-mail:** Euan.McGookin@glasgow.ac.uk

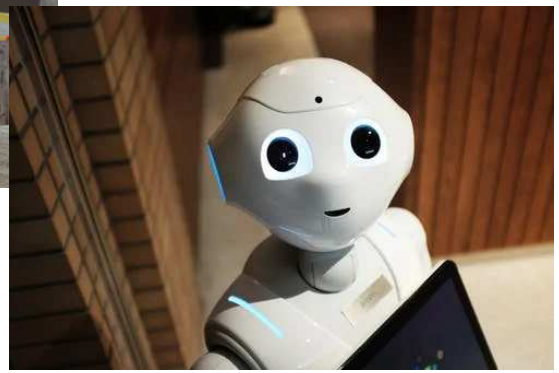
RoboCup

RoboCup is an international series of competitions centred around robotics and robotic systems. Some examples of the competitions are given below:

- Soccer
- Humanoid Soccer
- Rescue Robotics
- Domestic
- Simulation

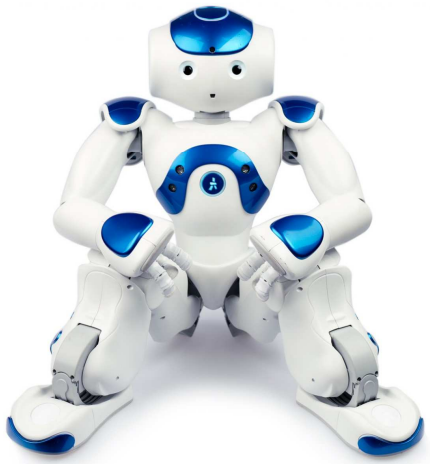






Virtual RoboCup Humanoid Kidsize Team

- https://humanoid.robocup.org/
- Pitch Dimensions are 9m by 6m
- 4 Robots in Teams
- Strikers, defenders and goalkeeper



- NAO6 humanoid robot to be used
- Dimensions 574x 311x 275 mm

Simulation Environment

In teams you will create a simulation of 2 competing robot soccer teams and the playing environment.

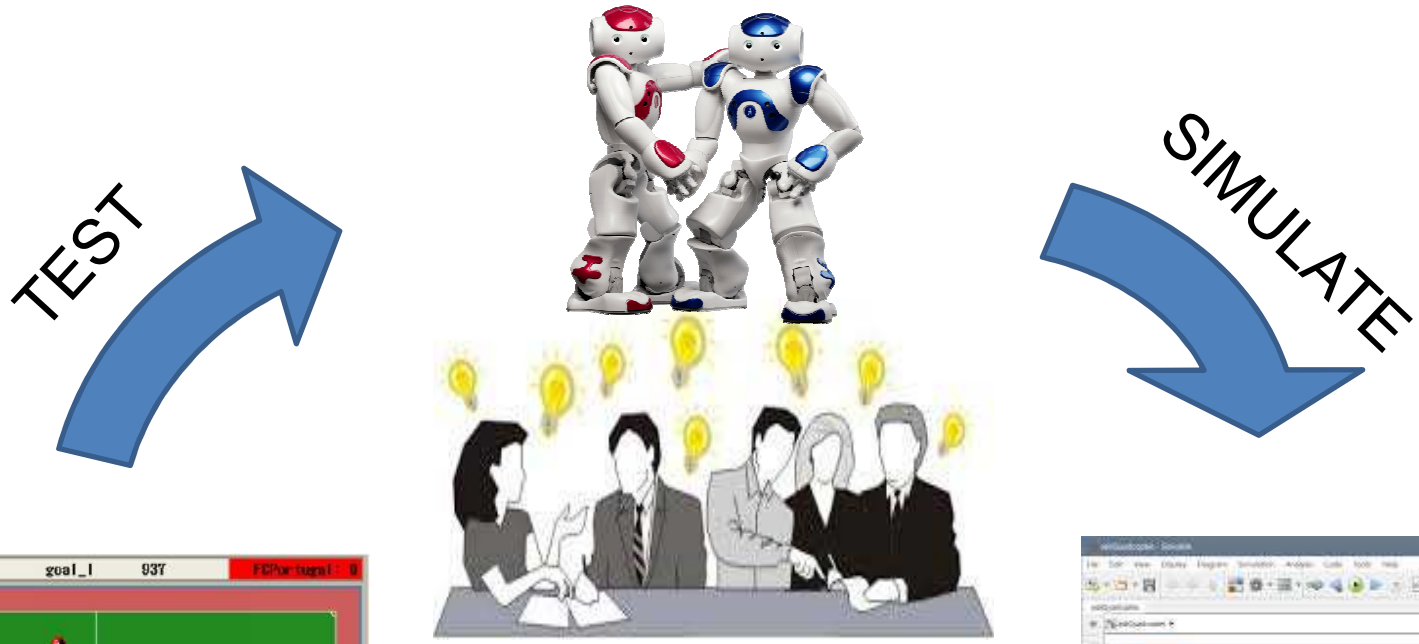
For this project the robot soccer teams will be simulated using Matlab software and associated packages (e.g. Simulink, Stateflow), or ROS.

This will allow behavioural algorithms to be implemented for the different team members.

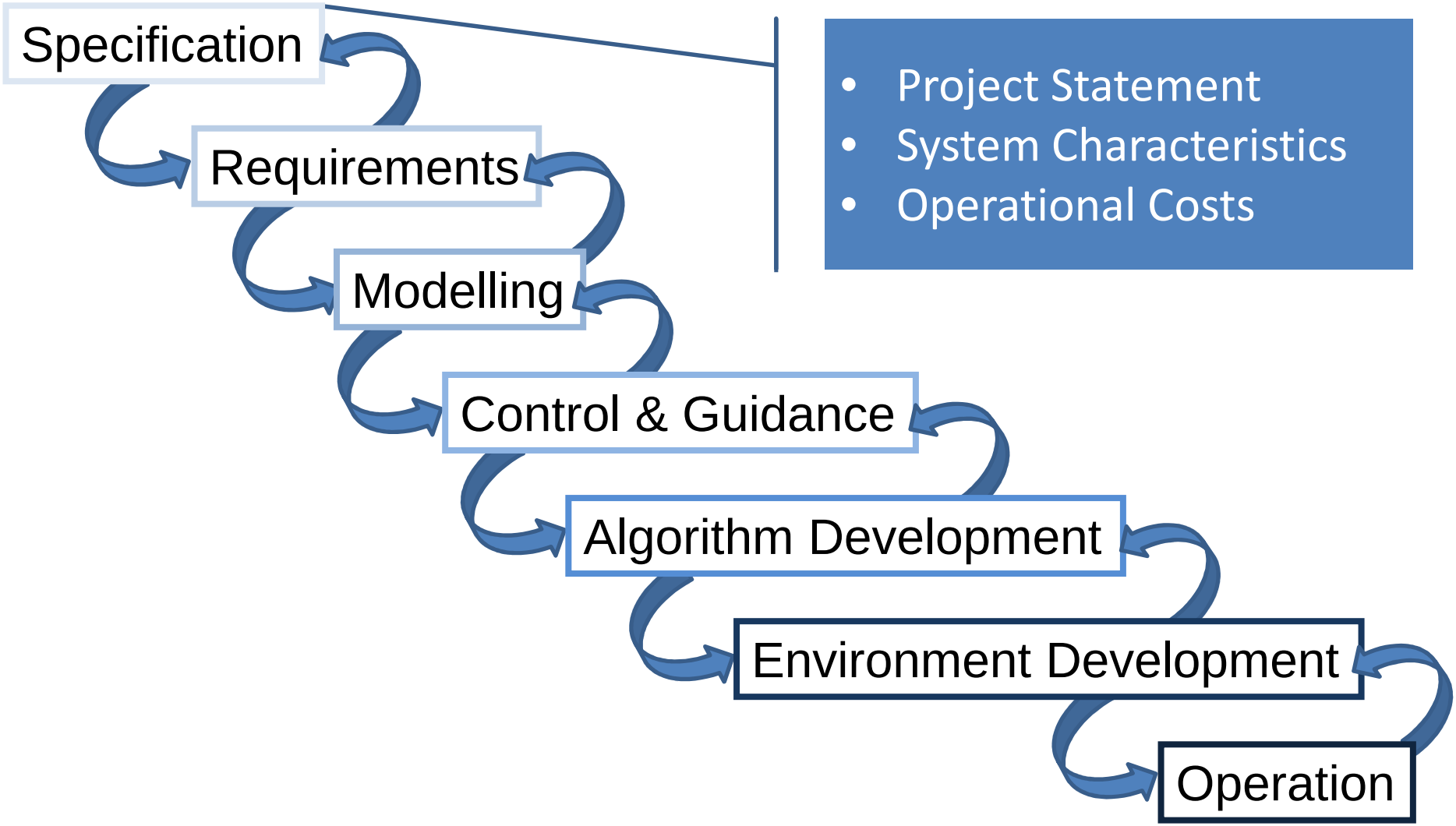
As well as developing simulated robots and implementing their behavioural algorithms, there should some visualisation of the pitch and players

Project Design Task

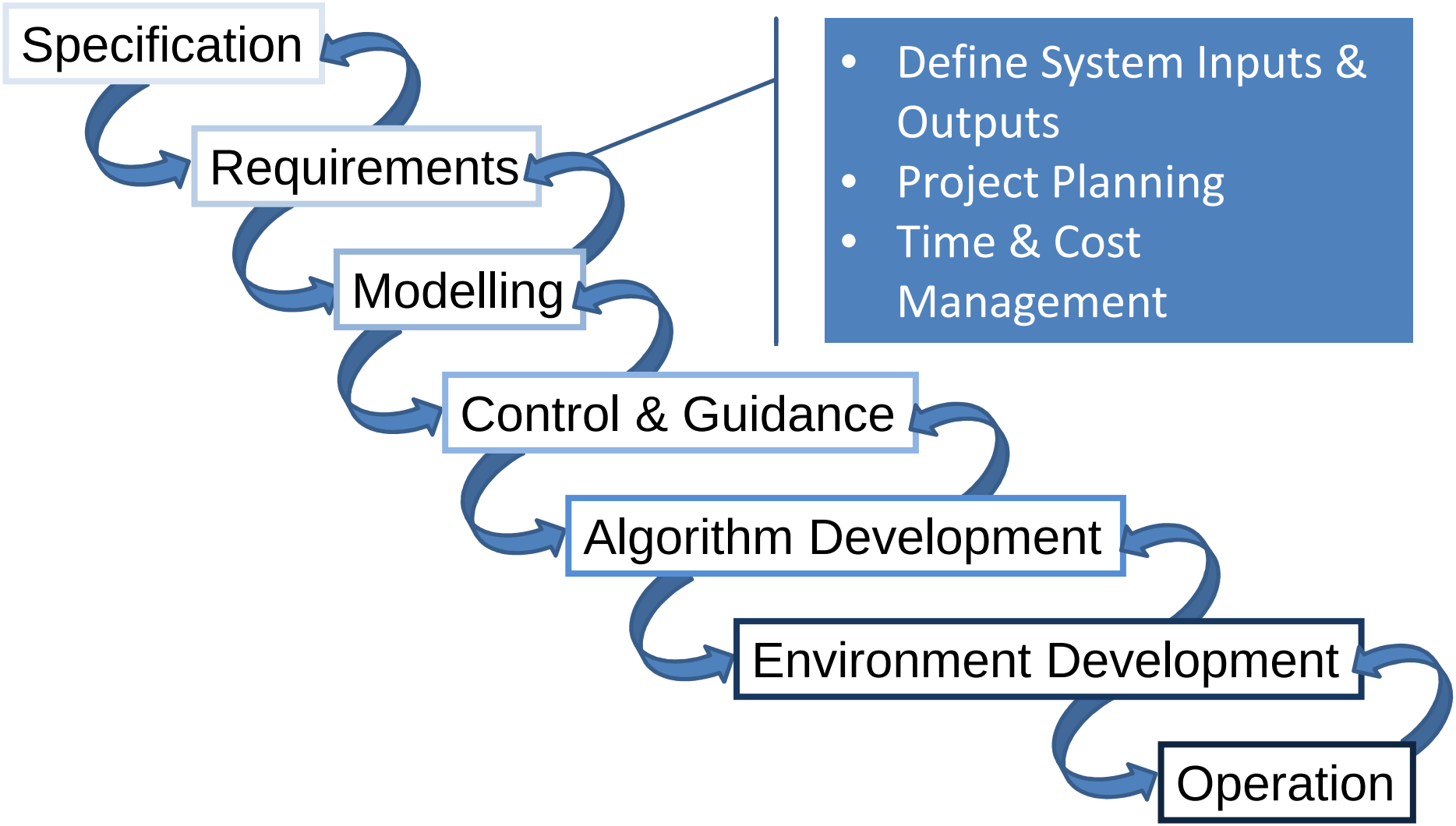
In teams you will design a simulated RoboCup Humanoid Soccer Team to play within a simulated environment.



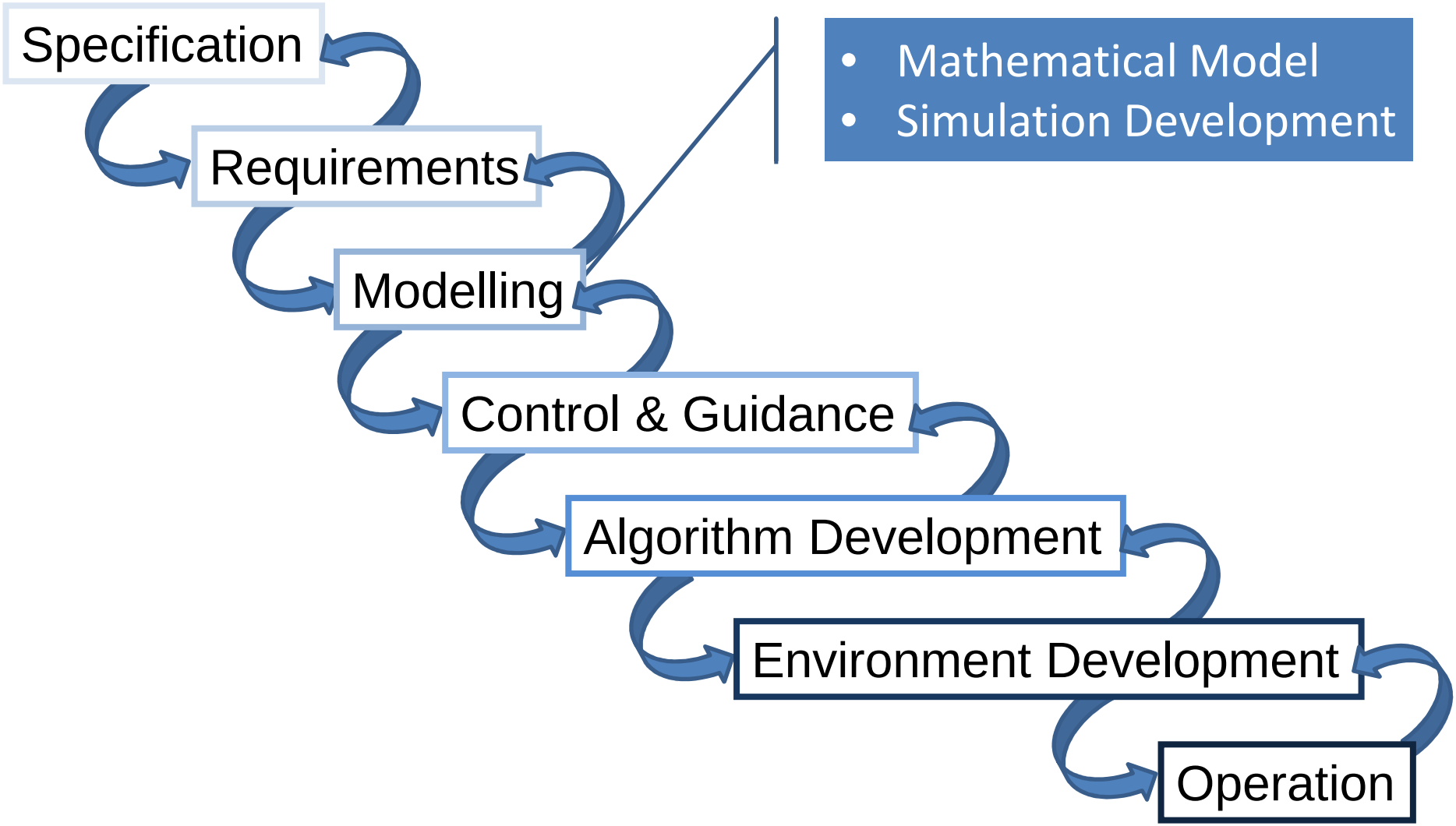
Waterfall Approach



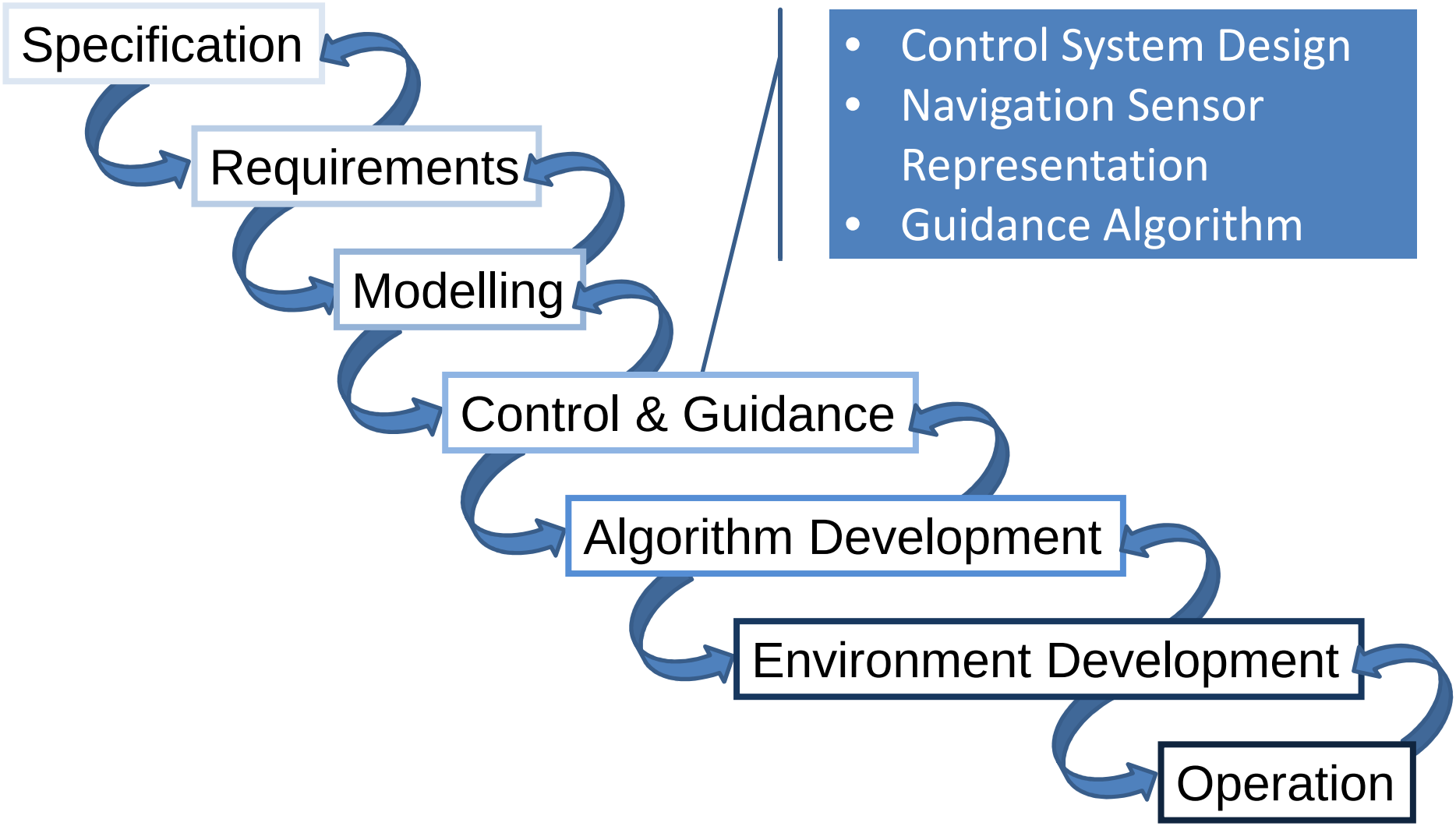
Waterfall Approach



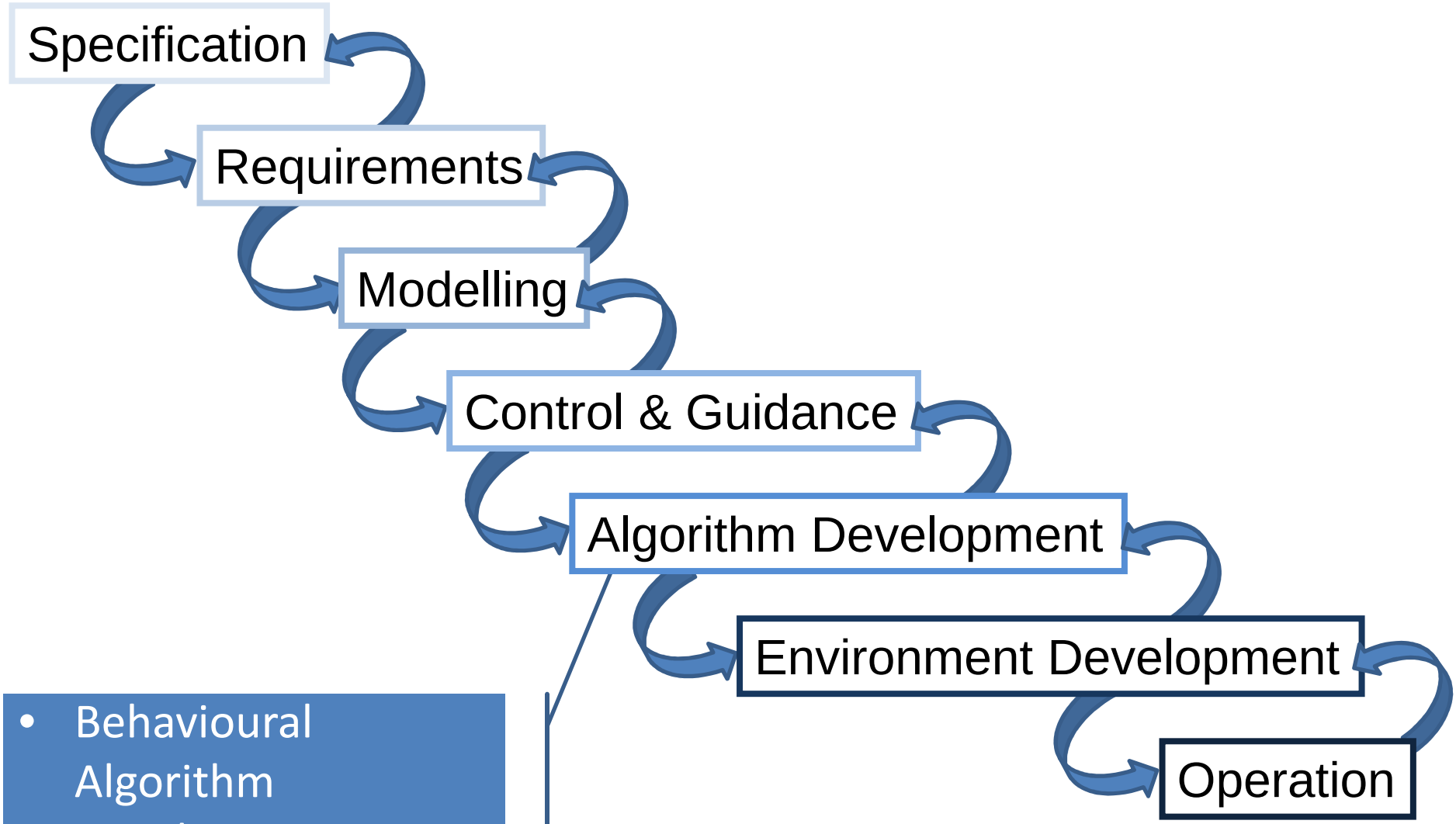
Waterfall Approach



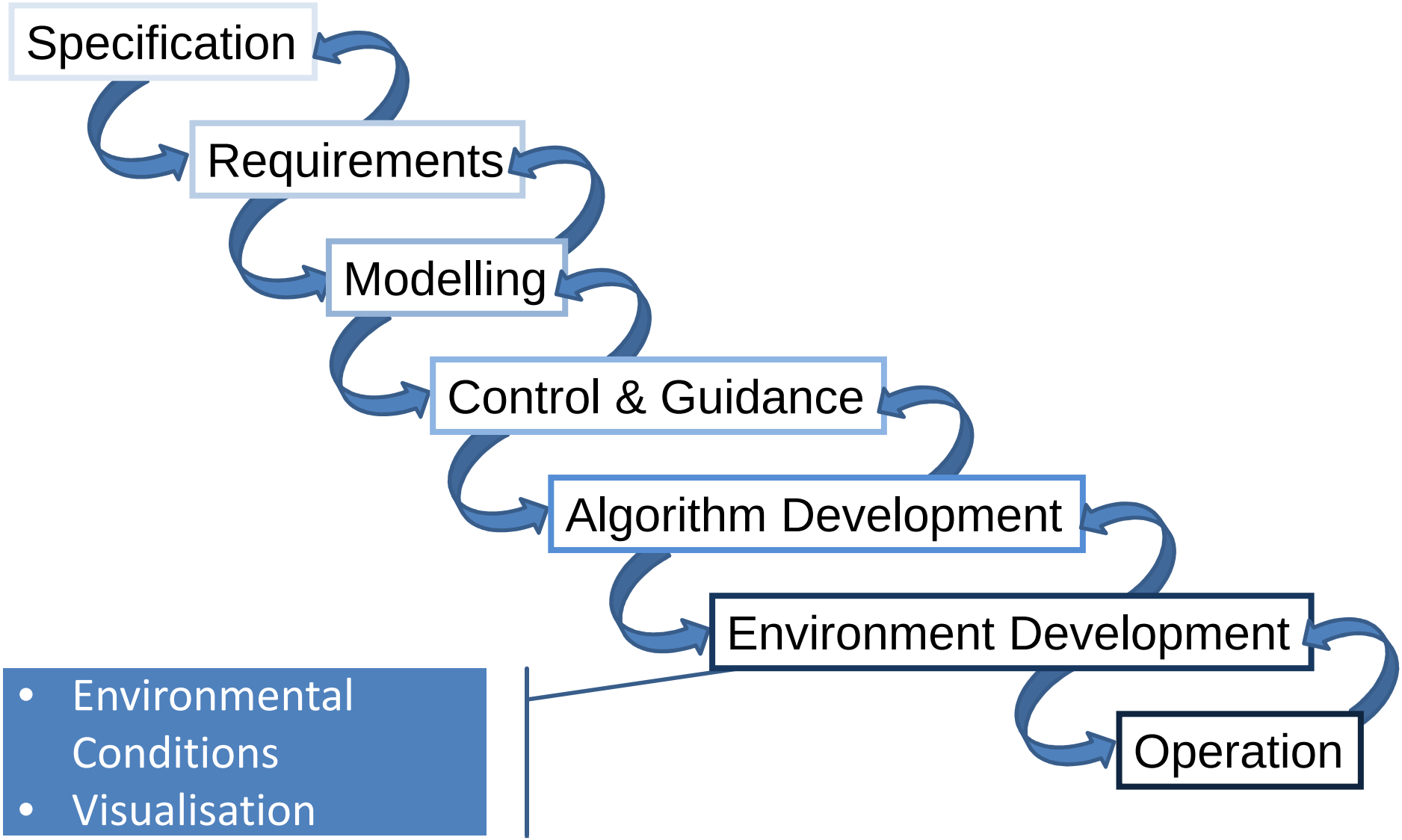
Waterfall Approach



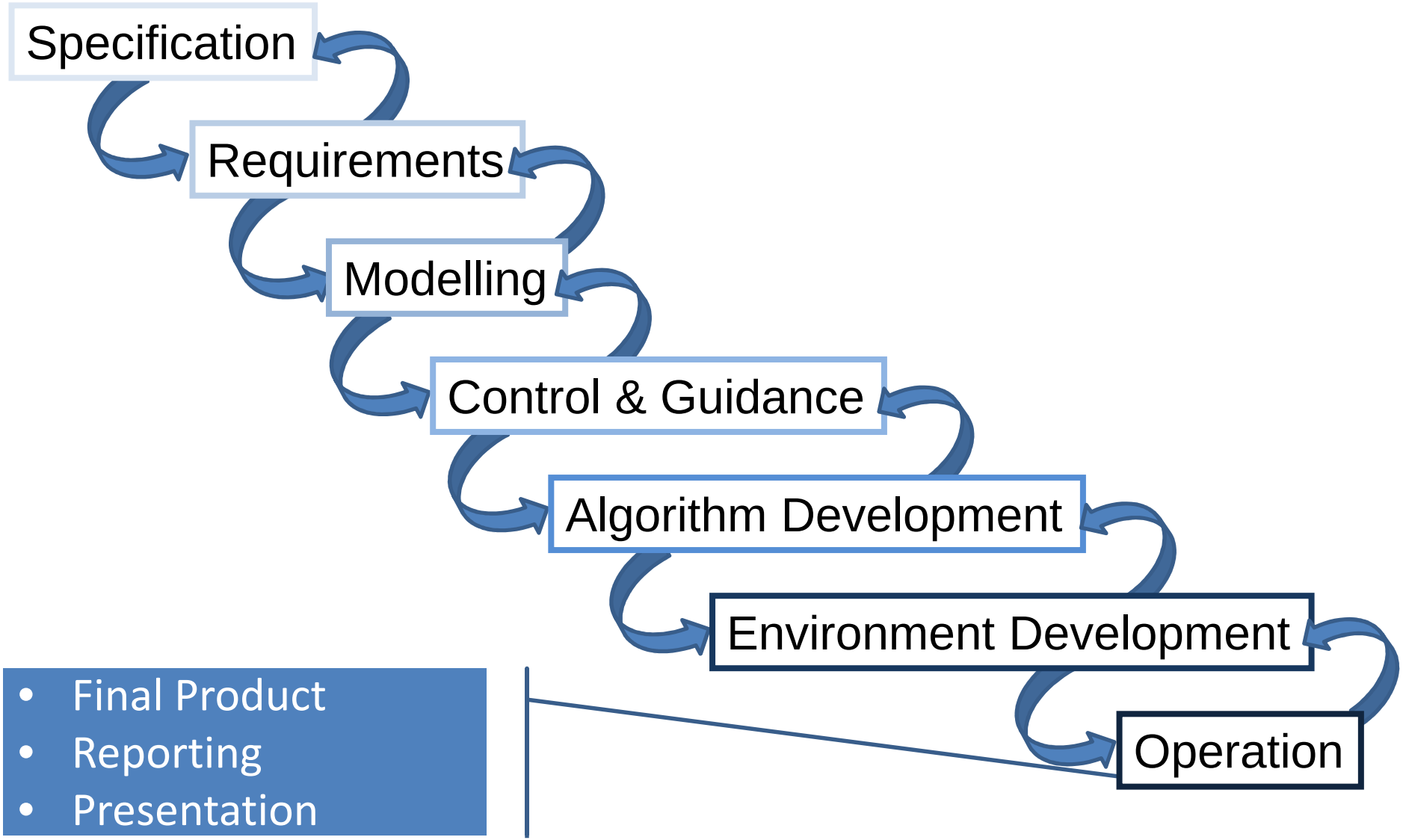
Waterfall Approach



Waterfall Approach



Waterfall Approach



Design Schedule & Review

The project will consist of the following design stages:

- Development of a simulation of a humanoid robot for soccer based on the NAO6 robot
- Design of control and guidance algorithms for the robots to navigate the pitch
- Development of simulated environment for 2 teams of 4 robots to play soccer
- Develop a multi-agent simulation of the RoboCup Humaniod Kidsize Soccer Team
- Development of algorithms to implement playing strategies for each of the robot teams
- Overall evaluation of the simulated robot soccer teams
- Critical Design Reviews (CDRs) will be performed at the end of each key stage

Project Management

Your team should consider the following:

- You will have a supervisor assigned to help supervise and monitor your team. The 5 supervisors are:
  - Dr Euan McGookin (Euan.Mcgookin@Glasgow.ac.uk)
  - Stuart Shilliday (s.shilliday.1@research.gla.ac.uk)
  - Luca Löttgen (j.loettgen.1@research.gla.ac.uk)
  - Daniel Mitchell (d.mitchell.5@research.gla.ac.uk)
  - Iftikhar Ahmad (i.ahmad.3@research.gla.ac.uk)
- The management structure for your team – every member has to contribute
- The division of workload – every member has to contribute
- Meeting times for your team with and without your supervisor
- One member of your team should be assigned as the communication officer who will email your supervisor
- The subject for all emails should begin “ENG5325 …” so that your supervisor can safely filter your emails

Project Meetings

- Each team will have 1 scheduled meeting per week with your supervisor (take minutes!)
- These meetings will be used to provide help and guidance on the technical aspects of the project
- In addition, Technical progress and Team work will be assessed during the meetings
- Time Allocation Records (TARs) to be kept through project and presented at the supervisor meeting every 2 weeks.
- Additional meeting should be charged as *Expert help*
- Report and presentation are due at end of project

Time and costs

- Time and cost estimates will be made by each team at the beginning of the project
- Records of time spent on each element of the project will be kept and reported by each team – using the Time Allocation Record (TAR) provided
- Staff cost £100 per team-member per hour
- Expert help cost £1000 per hour (the weekly meetings are not to be considered as expert help)
- Time and costs figures have to be presented every 2 weeks at the meeting with supervisors using the TAR provided, which represent a formal declaration of how the team worked in the period.

Time Allocation Record (TAR)

Fortnightly Time Allocation Record

Team Number: Reporting Period:

	Name	Student #	Role
Team Member 1			
Team Member 2			
Team Member 3			
Team Member 4			
Team Member 5			

#	Workpackage	Activity	Start Date	End Date	rs: Team membrs: Team membrs: Team membrs: Team membrs: Team membrs: Team memb	Total hours
1						0
2						0
3						0
4						0
5						0
6						0
7						0
8						0
9						0
10						0
11						0
12						0
13						0
14						0
15						0
		OVERALL TOTAL			0 0 0 0 0 0	0

Initial Project Tasks

Your first tasks are:

- Arrange a team meeting (19 teams with approx. 6 per team)
- Arrange meeting with your supervisor during this week
- Get acquainted with your group members
- Determine your Team Management Structure
- Plan your project design activities in terms of time management using a suitable timing diagram (e.g. a Gantt Chart)
- Include the CDR in your timing diagram
- Estimate the cost of your project based on utilisation of staff time (this will be compared against the actual time/cost recorded during the project) – this has to be determined in the first week
- Present group capabilities, project plan, time schedule and cost estimate at first meeting with your supervisor

Assessment

Assessment of the project will be through a team technical report, team presentation and continuous evaluation of teamwork throughout the project. The percentage for each component is given below:

Assessment Components	
• Report/technical work	60%
• Teamwork	30%
• Presentation	10%

In addition to indicating individual contributions in the report and presentation, each member of the team will complete a peer review form indicating the percentage contribution for their team members. This will be combined with the marks for report, teamwork and presentation.

Recommendations

- Manage your time efficiently
- Manage your costs efficiently
- Work as a team
- Do not cheat: **the University's plagiarism and Student Conduct policies apply**

- Start working now and get full advantage of this team activity


University of Glasgow
Thank you for listening – time for your questions!
WORLD CHANGERS WELCOME