The System Design Project
Purpose

Barbara
Aim: to design a system

The System Design Project is an Informatics institution - in fact it pre-dates the School of Informatics.

The system to be designed in the project has varied over the years:

- Robot shopping
- Mars lander
- Robot mine clearance
- Robot football
- This year...
The **System Design Project** is something of an Informatics institution - in fact it pre-dates the School of Informatics. The system to be designed in the project has varied over the years:

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- Robot football
- This year… Assistive robotics (more about this later)
Aim: to design a system

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But the goal of the course remains the same
In summary

The System Design Project is intended to give students practical experience of:

(a) building a large scale system
(b) working as members of a team
(c) documentation and presentation of a project.

We expect you to take a professional approach to all these elements.
On completion of this course, the student will be able to:

1. Work as a member of a team in designing and implementing a complex and multi-faceted system
2. Plan and monitor the effort of a project to meet milestones and deadlines, within a limited time scale
3. Draw together knowledge and understanding of wide areas of software and hardware systems
4. Demonstrate and present the outcome from a practical project
5. Document the feasibility, design and development of a potential product
1) Work as a member of a team

- In previous courses you have perhaps worked in groups of two or three, but for SDP you are in groups of 7 or 8, which is a very different experience.
- Your best individual strategy to get a good mark is to help your team to get good marks.
- Remember the key factor for good teamwork is effective communication. Patience and understanding is also important!
2) Plan and monitor the effort

- The amount of work requires division into subtasks and subteams, but also work on integration.
- Your initial time (and some time along the way) should be spent in planning, so that you have a good idea of what needs to be done when.
- Once you have a plan you are able to monitor progress and adjust how you are working (or the plan!) if necessary.
- We expect you to use project tools such as Trello, Github and Slack
3) Draw together knowledge

- Ideally, your team is more than the sum of its members, so you should identify your complementary experiences and strengths.
- You are encouraged to use (with attribution) existing codebases and designs, and should spend time exploring resources.
- This should also be a chance to put into practice much that you have learnt on your degree up till now (including Professional Issues topics, particularly communication).
4) Demonstrate the outcome

- On the final day representatives from a number of companies join the course organisers to judge the presentations and demonstrations of your systems.
- In the past companies represented have included Accenture, Google, Amazon, KAL and IBM.
- The representatives will be judging whether they would invest in your system and/or your team.
5) Document the design

- You will submit three group reports:
  - A proposal, submitted week 2, describing what you propose to do, including how you are organising yourselves and managing the project.
  - A user guide, submitted shortly before the demo day, documenting how your system works.
  - A technical report, submitted shortly after the demo day, giving details of the design and implementation of your system.
- There will also be an individual report (submitted with the technical report) reflecting on your own contribution.
Questions so far…?
Timetable

James
## Planning Week

- Focused SDP work
- Outlining a project plan
- More later...

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# Report Hand-ins

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- **3 Group reports (15% each)**
  - Proposal
  - User Guide
  - Technical
- **Individual process reflection (10%)**
## Industry Guest Lectures

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### Wednesday mornings:
- Agile Development (Amazon)
- Version Control (GitHub)
- Robotics Startups (FiveAI)
- Technical Writing (KAL)
- Careers (Careers Service and Skyscanner)
- One more tbc
# Client Demos

## Wednesday mornings:

- Self-determined milestones
- Present progress
- Questions from postgrad “client”
- Agree updated plan

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Delivery Week

- Two all-day events
- Specifics tbc
- Thursday: Technical Focus
  - Final client demos
- Friday: Marketing Focus
  - Industry “investors”
  - Product sales demos
- Prizes!

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Domain

Calum
Assistive Robotics

- A robotic appliance that helps the human user in some capacity where they have difficulty to complete the task themselves

- A very open domain, all that is needed is for you to identify a problem, and design a prototype solution
Internal Transport: MiR100

- Problem: A considerable amount of staff resources are dedicated to transporting goods within a factory

- Solution: A low cost, easy to use robotic platform
Body Extension: Da Vinci

- **Problem:** The human hand needs to perform delicate tasks consistently well, which may not be possible due to impairment and/or time

- **Solution:** Extend the hand with a robotic agent that does not tire
Care: MiRo

- Problem: Elderly care is not keeping up with the demand that is drastically needed

- Solution: Create an autonomous agent that can monitor in a safe and comforting manner
Resources

Calum
Equipment

Each group will get:

● 2 Lego EV3 bricks
● 1 Arduino board
● A personal desktop
● Near infinite supply of Lego
● Each group will also get a budget
Lab space

REFURBISHED STUDENT SOCIAL/STUDY SPACE

LEVEL 3
The SDP team

Barbara Webb
Course Organiser

Jane Hillston
Course Organiser

James Garforth
Teaching Assistant

Calum Imrie
Assistant T.A.

Ludovica Luisa Vissat
Assistant T.A.

Garry Ellard
Technician
Your team!

1

Adomaitis, Jonas
Ciobanu, Mihai
Girkins, Max
Lindsay, Andrew
MacLennan, Michael
Pratt, Bob
Sucik, Sam
Your team!

Agarwal, Hirsh
Comino Carreno, Alberto
Cox, Cecil
Grilec, David
Liu, Haoyu
Maharaj, Rajiv
Moore, Paul
Your team!

Calvi, Antonia
Cooke, Kyle
Guillen Garcia, Santi
Logan, Heather
Mohorko, Jaka
Morgan, Oliver
Postance, Nick
Your team!

Avasiloaie, Laurentiu
Chen, Patrick
Halios, Panayiotis
Hunter, Joe
Richardson, Nick
Szabo, Jazon
Vasilev, Pesho
Your team!

Culemann, Abbi
Lukosiute, Viktorija
Milisavljevic, Stelios
Nawrocki, Wojciech
Purslow, Claire
Roy, Alex
Vladu, Sorin
Your team!

Brisan, Alex
Cumming, Ryka
Lolova, Lambrina
Michaelides, Michael
O'Shea, Donal
Pilnan, Brano
Rotar, Adela
Your team!

Budrys, Povilas
Charayaphan, Nakorn
Cummins, John-benito
Dickinson, Callum
MacHaj, Jakub
McDonnell, Simon
Ross, Andrew
Your team!

Bizon, Julia
Caisova, Nina
Czuczka, Adrian
Jenkins, Ross
O'leary, Aran
Sabahi Khosroshahi, Afshin
Smith, Wesley
Your team!

Kambersky, David
MacRae, Christy
O'donnell, James
O'neill, Holly
Schulze Navarrete, Pedro
Torroba Hennigen, Lucas
Werenski, Matt
Your team!

Catarino Carvalheiro Neto Sant, Joao Paige, Rosina Scott, Campbell Shand, Alex Waddell, Stephen Wilk, Grzegorz Worton, Katie
Your team!

Cerrahoglu, Ali
Domanski, Lukasz
Duan, Boyan (Michael)
Karavasileva, Dilyana
Man, Daniel
Pandey, Abhishek
Sekuloff, Ruth
Your team!

Asher, Rusab
Dunn, Sarah
Foster, Joe
Kancleris, Ignas
Kingsland, Hannah
Markelis, Ignas
Parafinski, Mateusz
Your team!

Chandrashekar, Siddharth
Enache, Mihai
Latif, Hamza
Mazzone, Leonardo
Parrott, Colin
Sharples, Charles
Ye, Chenghao
Your team!

Kluvanec, Roman
Koster, Susanne
McCarrison, Matthew
Pavlisin, Adam
Petrov, Plamen
Shek, Nicole
Yi, Ruitao
Your team!

Chandiramani, Akshay
Chattarji, Agnibho
Iordan, Vlad
Kozlowski, Thomas
Nicoletti, Stylianos
Shu, Chang
Yin, Jason
Your team!

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Chaudhry, Zain
Gangwal, Anirudh
Garnham, William
Li, Weijian
Pevceviciute, Rugile
Reichelt, Tim
Yong, Adelaide
Your team!

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Genkova, Stefani
MacGregor, Tizzy
Merry, Glen
Pietz, Alexander
Snel, Jasper
Van Biljon, Philip
Yotov, Boyan
Your team!

Cholakova, Mariyana
Dauenhauer, Michal
Iftekhar, Mahbub
Lavrik, Deividas
Speers, David
Wu, Alice
Zhan Chen, Finn
Your team!

Chen, Yijie
Cheshire, Callum
Georgiev, Ignat
Lekuse, Caelan
Miseviciute, Karolina
Plankyte, Vaida
Stewart, Alex
Your team!

Georgescu, Teodora
Georgiev, Pavel
Koupparis, Michail
Mitchell, Andrew
Strahan, James
Varnava, Vivian
Zhao, Wilhelm
Planning Week 1

James
Planning Week

- Monday - **Introduction, Team Building and Meeting Mentors**
- Tuesday - Background Research, Initial Product Decision
- Wednesday - **Two Guest Lectures**, User Stories, Subtasks
- Thursday - Project Management Strategy
- Friday - Prepare and **Deliver Pitches**
Summary
(what makes SDP different)

Barbara
SDP is about...

- Setting your own goals

- Dealing with a large task:
  - Not possible to do alone
  - Not broken down for you

- Dealing with the real world:
  - Planning for the unexpected
  - Planning for human fallibility

- Not just doing, but communicating what you have done.
Questions?