SUBJECT OUTLINE

81539 Impossibilities to Possibilities

Course area UTS: Creative Intelligence and Innovation
Delivery July 2016; City
Credit points 8cp
Result type Grade and marks

Subject coordinator

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Teaching staff

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Subject description

In this subject, participants engage in a creative series of practical activities that bring them to a broad understanding of creative intelligence and innovation as a field of practice. Through exploring what first seem to be impossibilities, they begin to investigate and reframe complex challenges, and experiment with new opportunities afforded by technology. Participants are challenged to analyse problem situations from multiple perspectives and to integrate these findings in ways that lead to new possibilities. Their first-hand experience in this subject of the nature of today's open, complex, dynamic and networked problems enables them to develop and hone their skills in multidisciplinary team collaboration, visualisation, modelling, representation and presentation.

Subject learning objectives (SLOs)

This subject contributes to the students' learning as follows:

1. Identify, describe and explore a range of challenges in order to discern significant opportunities and generate possibilities
2. Consider and use observation and visualisation methods from disciplinary practices to probe and generate new associations or findings
3. Explore and describe a complex environment as an interrelated map of humanity
4. Select, test and evaluate different disciplinary methods for gaining insights into a complex system
5. Frame and communicate experiences, ideas and findings to see the problem or context differently
6. Articulate and explain the thinking behind particular selections of ideas, strategies, findings and interpretations generated in multidisciplinary teams
7. Develop a clear and convincing rationale to support the proposal for a particular possibility

Teaching and learning strategies

Learning will take place in a collaborative, immersive, experiential, studio-based environment. Students will work with academics from one of UTS's research centres, participating in a series of practical activities as individuals and teams. Students will also undertake a project set in a real life context to explore and generate possibilities.

Program

Week/Session	Dates	Description
1	Monday 4 July	*The Power of Unreasonable Ideas* The day begins with a welcome to the subject and a discussion of what it means for something to be *impossible*. Starting with Michio Kaku's impossibility classes, we will develop a framework for understanding 'impossibilities' and their underlying challenges. You will then engage in a series of practices that will help you understand creative processes and ways of thinking. You'll be asked to contribute to questioning, speculative scenarios, thought experiments and analogical thinking to generate new possibilities. You will begin working on the first assessment. You'll take ICI practices and techniques to explore complex challenges that capture your imagination or interest. You will also create your first journal entry for your reflective diary.
2	Tuesday 5 July	*Create a Map of the Challenge* The day will begin with a discussion of group and social practices of Creative Intelligence and Innovation (ICI). Teaching staff from one of UTS's research centres (the 'Magic Lab') will present case studies of their work and how they have applied the practices and techniques of ICI in their teams. They will talk about the complex challenges that they are tackling and bring to life the programs they are undertaking in relation to Social Robotics. You will work in multi-disciplinary teams and identify an opportunity space, provoked by the question 'How could robots be helpful, socially?' You will work together to explore why the problem matters, understand the underlying challenges and identify possible new perspectives to start comprehending the problem. After selecting an opportunity space, you will again use ICI techniques from Day 1 to generate rich and worthwhile ideas and examine the underlying bottlenecks.
3	Monday 11 July	*Interpret Data and Observations* The day begins with a "crash course" in experimental methods. Your group will then refine your Assignment 1 solutions with each other and work to prepare an experimental plan that advances your understanding of the opportunity space. For example, you might use role-playing, you might analyse videos of interactions, you might visit a place where those interactions are happening naturalistically in real time, or you might create a controlled study. In fact, you will use multiple techniques iteratively, as you improve your understanding of the problem. Your plan will be approved by your academic mentor and your group will conduct the study. You will bring the collected data back to the lab and will use the data in a tutorial on visualization and data analytics. By visualizing the data, both as a team and with the academic mentor supporting your

		group, you will continue to enrich your understanding of your problem space. As your understanding of the problem increases, your group will repeat the process several times. As you progress, you may not necessarily understand what you're collecting and there might be surprises. However, with each iteration, you will improve both your understanding of the problem space and of opportunities in that space.
4	Tuesday 12 July	*Prototype to Learn* This day will begin with an overview of techniques for rapid prototyping, including a 'code bootcamp'. You will use your growing understanding of robots, technology and rapid prototyping techniques to start transforming your ideas and thoughts from an apparent impossibility into the realm of possibility. Your academic mentor will help you understand how various disciplinary perspectives might bring further insight to your ideas and spark new possibilities for experimentation and prototyping. For example: you might use rapid prototyping tools to create a working prototype of a mobile app; you might role-play a robot interaction; or you might even perform a 'Wizard-of-Oz' study with a real robot.
5	Monday 18 July	*Inspire Others* If you're going to do the impossible and change the world, you'll need some help. How do you convince others to join your cause? The day will begin with discussion about strategies for clear communication, storytelling, presenting a compelling pitch and inspiring others to join your cause. You will then work with your academic mentor to workshop ideas for transforming your insights into an engaging presentation. As you do this, you may realize that there are important gaps in your story that require further prototyping. You will have some time to perform additional studies if required.
6	Thursday 21 July	*Share Your Story* You will spend the morning finalizing your presentation for Assessment 2B, with academic mentors at hand for consultation. You will then present your polished presentation to your fellow students. These presentations will stimulate further class discussion. You will be able to draw on the insights of your fellow students to further develop your understanding of the challenge. There will be a re-briefing of Assessment 3 before closing remarks, a debrief of the subject content and your chance to provide feedback to the teaching team.

Assessment

Assessment task 1: The Power of Unreasonable Ideas

Intent: Working on your own, consider the challenge problem ("How can robots be helpful, socially?") in an opportunity space. Prepare an engaging report that (a) creatively interprets the opportunity space and identifies a future scenario and (b) explores why the scenario appears to be impossible.

Objective(s): This task addresses the following subject learning objectives:

1, 3, 4 and 5

Type: Report

Groupwork: Individual

Weight: 30%

Task: Please refer to the complete task description on UTS Online.

Due: 10.00pm Sunday 10 July 2016

Criteria:

- Appropriate application of a range of methods and practices from multiple disciplines to generate an original impossibility
- Depth of analysis of the impossibility using the impossibilities framework
- Depth and clarity of your written interpretations

Assessment task 2: Prototype to Learn and Inspire Others

Intent: Working in groups of three or four, you will select a challenge or a combination of challenges posed by an apparent impossibility. Your objective is then to test the challenge: you will create a series of experiments, observational activities and prototypes that will advance your understanding of the challenge.

For this assessment, you will plan and conduct a series of experiments. You will report on your experiments through an engaging presentation that highlights the surprising discoveries that you have made.

The presentation will use story-telling, multi media and demonstrations to compellingly communicate:

- Your opportunity space, your future scenario and the underlying contradictions and challenges that make this an apparent 'impossibility'
- What you set out to explore
- An explanation of how your understanding of the problem domain and its challenges has evolved as a result of your study

Objective(s): This task addresses the following subject learning objectives:

2, 3, 4, 5, 6 and 7

Type: Presentation

Groupwork: Group, group and individually assessed

Weight: 50%

Task: Please refer to the complete task description on UTS Online.

Due: 1.00pm Thursday 21 July 2016

Criteria:
- Effective use of methods (Do the study protocols address their objectives and are the studies well-considered and ethical?)
- Ability to adapt as you learn (Did you learn, adapt and iterate appropriately with methods from a range of disciplines as you learned more about the challenge?)
- Clarity, succinctness and originality of questions, speculative ideas, scenarios, analogies and critiques that apply a range of disciplinary methods
- Bold and compelling presentation of insights gained, demonstrating an understanding of the thinking behind the perspectives used

Assessment task 3: Making Sense of the Journey

Intent: Prepare a reflective journal. For each of the first five classes, you must submit a short journal entry of at least 100 words within 24 hours of the conclusion of class. The final entry, of approximately 1000 to 1500 words must be submitted before 9pm on Sunday 24 July 2016. Your journal should show critical reflection as well as insights into how you may apply the ICI practices to your own discipline of expertise.

Objective(s): This task addresses the following subject learning objectives:

2, 3, 4, 5 and 6

Type: Reflection

Groupwork: Individual

Weight: 20%

Task: Please refer to the complete task description on UTS Online.

Due: For each of the first five classes, you must submit a short journal entry of at least 100 words within 24 hours of the conclusion of class. The final entry, of approximately 1000 to 1500 words must be submitted before 9pm on Sunday 24 July 2016. Please refer to the assignment description on UTS Online for a table of deliverables and their due dates.

Criteria:
- Clarity, succintness and depth of personal reflection
- Ability to draw connections from the subject to other disciplines and challenges

Use of plagiarism detection software

Some assessment items will be submitted to the Turnitin plagiarism detection system via UTS Online. Please review the Turnitin terms and conditions prior to the assessment due date. Contact the subject coordinator if you are unable to agree to the conditions.

Required texts

Dennet, D. 1996, ‘How to make mistakes’, in J. Brockman & K. Matson (eds.), How things are: a science tool-kit for the mind, Phoenix, London, pp 137–144.

Kelley, T. & Littman, J. 2002, ‘Innovation begins with an eye’, in The art of innovation, Harper Collins Business, London, pp. 23–52.

Berger, W., 2014, ‘Introduction: why questioning?’, in A more beautiful question: the power of inquiry to spark breakthrough ideas, Bloomsbury, New York, pp 1–9.

Pollack, J. 2014. ‘The model T-bone: how analogies spark innovation’, in Shortcut: how analogies reveal connections, spark innovation, and sell our greatest ideas, Gotham, New York, pp. 64-107.

Hill, L., Brandeau, G., Truelove, E. & Lineback. K. 2014, ‘1. What collective genius looks like’, in Collective genius: the art and practice of leading innovation, Harvard Business School Publishing, Boston, pp. 9-23. Available from http://collectivegeniusbook.com/wp-content/uploads/pdf/collectivegenius_excerpt.pdf.

Dennett, D. C., 2014, ‘Rapoport's rules’ in Intuition pumps and other tools for thinking, Penguin, London.

Recommended texts

Please refer to UTS Online for a list of readings. These readings are an important resource for your Assignments.

Graduate attribute development

The five graduate attribute categories of the Creative Intelligence and Innovation department are:

- GA1 Complex systems thinking
- GA2 Create value in problem-solving and inquiry
- GA3 Inter- and trans-disciplinary practices
- GA4 Imaginative and ethical citizenship
- GA5 Entrepreneurial and Intrapreneurial skills.

Course intended learning outcomes (CILOs) are linked to these categories using codes (e.g. 1.1, 2.3, 4.2, etc.).

The REVIEW criteria-based assessment system is being adopted in the marking of subjects to give students feedback about their development of these graduate attribute categories over time throughout their course of study. REVIEW also enables students to self-assess to encourage a self-reflective approach to their work.

Statement about assessment procedures and advice

Students must refer to the UTS assessment information, which is published in the Policy and Procedures for the Assessment of Coursework Subjects available at: www.gsu.uts.edu.au/policies/assessment-coursework

Statement on intellectual property

The University of Technology, Sydney retains your work to promote the University and/or its courses for an indefinite period. If you would not like the University to use your work in this way, please notify the subject coordinator in writing.

Statement on UTS email account

Email from the University to a student will only be sent to the student's UTS email address. Email sent from a student to the University must be sent from the student's UTS email address. University staff will not respond to email from any other email accounts for currently enrolled students.