Fostering Creative Visualisation Skills Through Data-Art Exhibitions

Jonathan C. Roberts
Bangor University
j.c.roberts@bangor.ac.uk

PRIFYSGOL BANGOR UNIVERSITY

Data art
Creative visualisation
Authentic assessment
Fostering skills
Exhibition
Visualisation education

Data art merges several disciplines, including data science, visualisation and art. The aim is to transform raw data into visual narratives. While visualisation encourages accurate and correct information display, the emphasis on data art is on creative expression.

The creation of data art (and display in an exhibition) offers a valuable project scenario for students. It constitutes an **authentic** task because it necessitates that students grasp real-world issues, overcome technical challenges, and produce work that is accessible to the public.

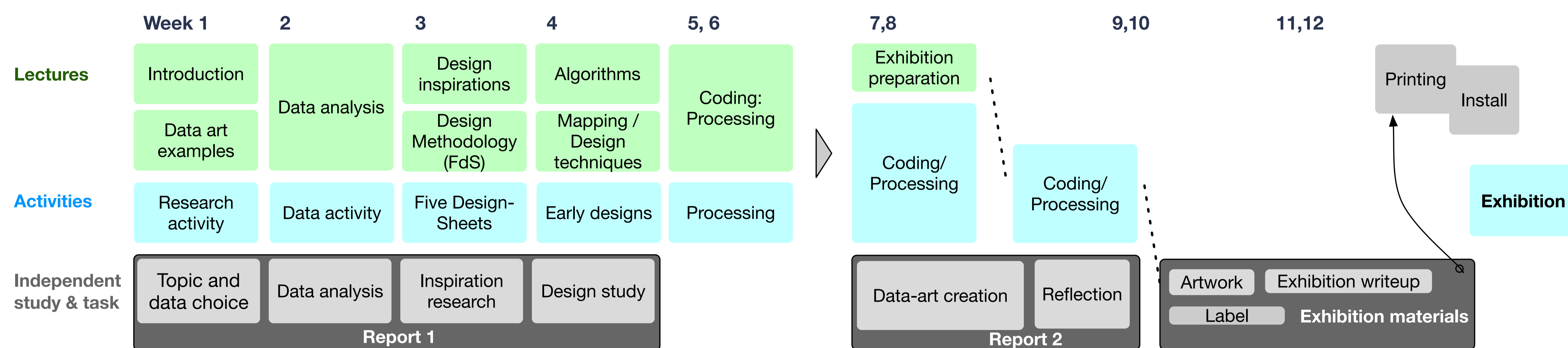| Overview |
| Lectures |
| Activities |
| Independent study and task |

This project-based learning enables students to focus on a task, learn about data analysis, design, generate inspired ideas, and implement a data-art artwork that is suitable for public display.

Students select a topic and corresponding dataset, which is registered with the teacher by the end of week 1

Module:	Creative Visualisation, available to third-year computing students.
Target Students:	BSc in Computer Science or Creative Technology.
Credits and Effort:	20 credits, equating to 200 hours of student work
	Lectures, classes, and independent study.
Assessment Requirement:	Students must produce a data art piece.
Data Art Piece:	Based on a dataset of the student's choice.
	Should be visually compelling and conceptually insightful.
	Transforms raw data into engaging and meaningful artwork.

	Week 1	2	3	4	5, 6	7,8	9,10	11,12
Lectures	Introduction	Data analysis	Design inspirations	Algorithms	Coding: Processing	Exhibition preparation		Printing / Install
	Data art examples		Design Methodology (FdS)	Mapping / Design techniques		Coding/ Processing	Coding/ Processing	
Activities	Research activity	Data activity	Five Design-Sheets	Early designs	Processing			**Exhibition**
Independent study & task	Topic and data choice	Data analysis	Inspiration research	Design study		Data-art creation / Reflection		Artwork / Exhibition writeup / Label / Exhibition materials
	Report 1					**Report 2**		

Lectures, activities & Study

The teaching takes place over 12 weeks, and each week students have lectures, in-class activities and tasks for independent study.

For example, in week 1, information is presented on data-art, the exhibition location and data-art examples. Students perform a data-art activity of locating examples (scavenger hunt).

Week 2 focuses on data. Lessons are given on data analysis, data formats, types of data, missing data, metadata and so forth. They follow a task of deconstructing the data into its various components (categorical, continuous, etc.).

We teach the **Five Design-Sheets (FdS)** method, and give an activity on sketching alternatives, and sketching using the FdS method. We also provide Students present their design-study and FdS in report 1.

Outcome

One student shared that they were "delighted and excited to be a part of the exhibition", while another expressed pride in seeing their work on display, saying, "this is my work". It achieved the intended outcome of sparking students' excitement and aiding them in crafting a high-quality submission.

Look further

❖ Roberts, J C., Headleand, C, J and Ritsos, P.D. Sketching Designs Using the **Five Design-sheet M**ethodology. TVCG 22.1 (2016): 419-428.
❖ Roberts, J. C., Headleand, C. J., and Ritsos, P. D. . **Five Design-Sheets**: Creative Design and Sketching for Computing and Visualisation. Springer. 2017
❖ Roberts, J. C., Ritsos, P. D., Jackson, J. R., & Headleand, C. **The explanatory visualization framework....** IEEE TVCG, 24(1), 791-801 2017
❖ Swaffield, S Getting to the Heart of Authentic Assessment for Learning. Assessment in Education: Principles, Policy & Practice,18(4):433–449, 2011
❖ Kosara R.. Visualization Criticism – The Missing Link Between Information Visualization and Art. In Proc IV, pp. 631–636. IEEE, 2007
❖ Vi´egas F. B. and Wattenberg M. Artistic Data Visualization: Beyond Visual Analytics. In LNCS, vol. 4564, pp. 723–732. Springer, 2007

Data-art & exhibition creation

The second part focuses on creating the data-art and the exhibition work.

We lecture on the practicalities of exhibition preparation and coding, and run a variety of activities focused on processing, helping students practice tasks such as plotting, layout design, loading data, saving to PDF, and more.

Students create their artwork in processing.org and deliver their exhibition artwork (as a PDF), and include a 120-word label, and exhibit commentary (of 500 words).

Students present their data-art creations and reflect on their work in report 2.

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https://www.bangor.ac.uk/

School of Computer Science and Engineering
https://www.bangor.ac.uk/scse

Five Design-Sheets
https://fds-design.github.io