

Visual Tools to Empower Citizens

2nd Edition

Course Code: 220058

Category: Master

Credits: 60.00

Language: English

Start date: 05/10/2022

Last session face-to-face session: 30/06/2023

End date: 30/06/2023

Day and Time: From October to March: Wednesdays, Thursdays and Fridays from 4 pm to 7 pm. From March to June hackathons will take place in online format on specific days (see the calendar) 100% of the classes will be held by videoconference.

Location: In streaming through the videoconferencing platform Zoom

Places available: 15

Prices and discounts

Price: 4.175 €

5% off for students and alumni of the University of Girona.

3.966,25€ (835 € Pre-registration + 3.131,25 € Enrollment)

5% off for students and alumni of the FUDGIF Masters, postgraduate and specialisation courses (Unless it is part of the same modular structure).

3.966,25€ (835 € Pre-registration + 3.131,25 € Enrollment)

5% off for persons with disabilities.

3.966,25€ (835 € Pre-registration + 3.131,25 € Enrollment)

5% off for persons unemployed at the time of enrolment.

3.966,25€ (835 € Pre-registration + 3.131,25 € Enrollment)

5% off for members of large or single-parent families..

3.966,25€ (835 € Pre-registration + 3.131,25 € Enrollment)

10% off for companies enrolling 2 or 3 employees for the same course (with the company billing).

3.757,50€ (835 € Pre-registration + 2.922,50 € Enrollment)

15% off for companies enrolling 4 or more employees for the same course (with the company billing).

3.548,75€ (835 € Pre-registration + 2.713,75 € Enrollment)

Informative Sessions

	Date	Time	Place
Informative session 1	25/05/2022	18:00	
Informative session 2	03/06/2022	14:00	

Reasons for doing the course

Reasons to take the course

There is a growing demand (an urgent need, it could be argued) for a hybrid profile that merges design and computing. Qualified professionals are needed who are capable of designing visualisation solutions for the public sector: from transparency tools aimed at citizens to intelligent systems for data-driven understanding, exploration and decision-making.

Professionals are required who can work within public administrations, but also in media or companies that wish to make data accessible to a specific audience or to a sector of their customers.

The specialised training described here is not offered anywhere else. International studies contain part of the content offered through this Master but in those studies the aforementioned content is not geared towards practice or towards the professional opportunities that currently exist.

Make data visible and use for social good

External practices

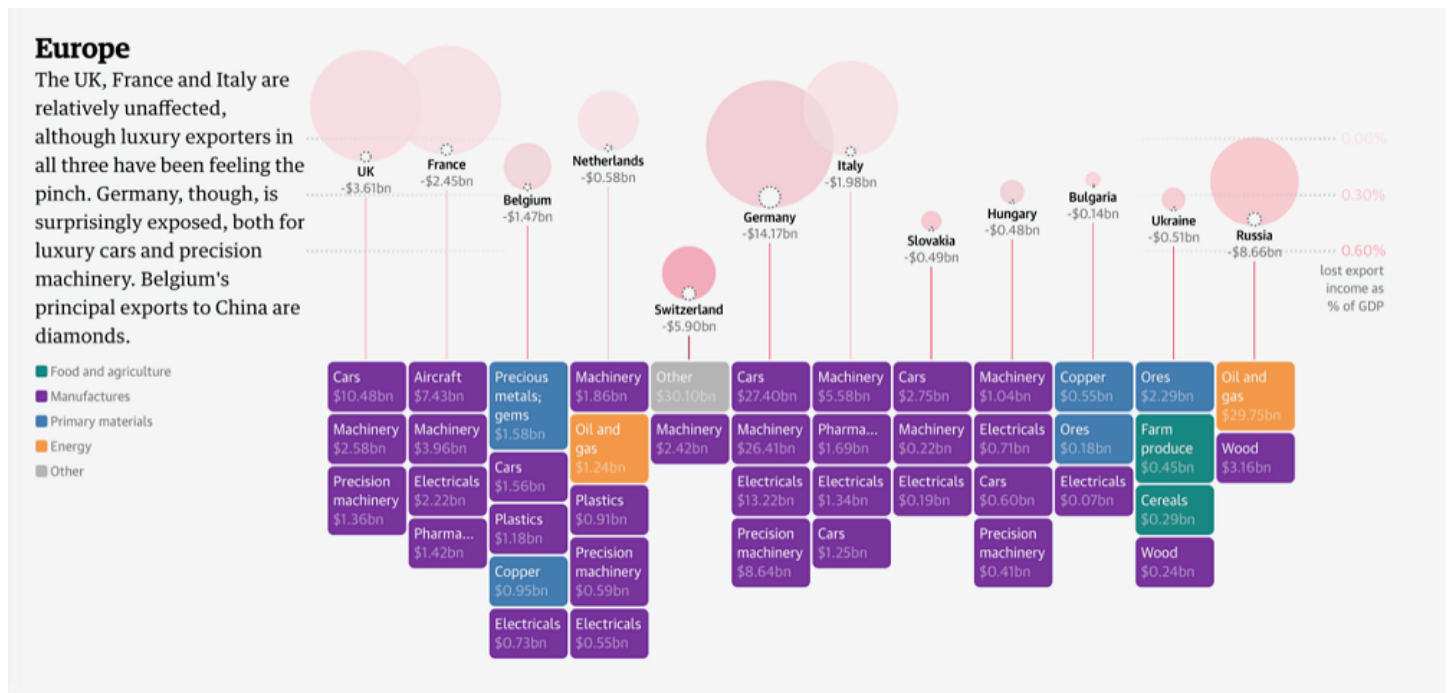
With the public and private partner entities listed above, along with others that may join us before the start of the Master.

Presentation

Presentation

In November 2019, the Publications Office of the European Union organised the first EU DataViz conference, under the motto “Serving citizens from better data visualisations”. The event brought together more than 500 people (mostly from the public sector) to discuss how to meet the needs of communities. Transparency laws passed in recent years in Europe require governments to open repositories of public information. However, if the general public does not understand the explanations of open data, public actions are of little use. This idea was reflected at the EU DataViz, both in the talks and in informal conversations. Public entities have a duty of care to citizens; they must create interfaces that explain and enable the discovery of data.

This Master aims to make strides in improving the visual literacy of data, as a citizen empowerment tool designed to measure and evaluate evidence-based public policies. At the same time, it aims to guide public administration bodies, research institutes and the media in good visualisation and transparency practices.



Aims

To train professionals to design and develop visual tools and public data exploration systems that increase transparency.

These include tools similar to those of the Govtrack.us project: Tracking the United States Congress, which in 2005 made available vast amounts of legislative data in a structured, open and visual format for researchers, journalists and public interest initiatives. This initiative served to develop dozens of open government projects up until 2017, when the US Congress began to publish open and structured data itself.

Although our focus will be on the public sector, the skills required to conceive and develop the projects will be transferable to other areas, ranging from interactive journalism to companies.

Professional outings

The radical change from visual and interactive journalism to the mainstream Anglo-American and European media (in which we have extensive experience) occurred the moment computer professionals entered the newsroom. Until then, journalists and “technical” staff were two worlds apart. They had virtually no contact with each other.

Although we are fully aware that the language of each specialisation involves technical differences, we are convinced that demand will grow in the coming years. Both profiles - design and programming - are essential for a visualisation team. The proof of this is that the most successful agencies and departments strike a balance of both.

Some of the most noteworthy professional opportunities are as follows:

- DataViz developers for public administration bodies
- Designers of interactive visualisations for public research institutes
- Data scientists and visualisation developers for data analytics companies
- DataViz designers or developers of interactive media systems or fact-checking agency systems.
- DataViz designers or developers of interactive systems for companies in any sector.

Who the course is for

Graduates in Computer Engineering, Biomedical Engineering, Biotechnology, Videogame Design and Development, Multimedia Studies, Bioinformatics, Science and Data Engineering, Geoinformation and Geomatics Engineering, Audio-Visual Systems Engineering or Data Engineering, among others.

The Master is also open to active professionals in the journalism or corporate communication sector (journalism, advertising, marketing), as well as to those from other branches of the Humanities, along with Social and Cultural spheres.

When it comes to selecting students, special emphasis is placed on female profiles of all the proposed disciplines, in order to ensure a much-needed perspective that is lacking in the professional market.

Admission requirements

Candidates must hold a university degree or equivalent (bachelor's degree, engineering, architecture, diploma, technical engineering or technical architecture).

In the case of a foreign university degree, the student must accredit a comparable educational level in the aforementioned degrees and must accredit eligibility to access postgraduate studies in their country of issuance.

If the candidate holds a degree in Communication, Humanities or the Social area, [they must accredit the prior completion of an intensive course in computer programming](#) and/or statistics.

Syllabus

Open data engineering and systems architecture

One of the necessary skills for creating scalable data exploration tools is how we store and process datasets. In this subject, we will address the foundations for building the architecture of traditional and modern data systems for big data. The basic concepts of cloud computing will also be discussed, with emphasis on solving specific needs for data analysis and science.

Data visualisation programming

One of the key capabilities of this subject is knowing how to implement visual interfaces for data exploration or communication at scale. A variety of technologies are featured, aimed at data visualisation production. In addition to showing a wide range of emerging tools, we will work with the libraries, frameworks and programming languages that have become a standard for visualisation, such as d3.js, Vega, R and Python.

Statistical programming

The course will provide students with practical knowledge of data analytics and statistical techniques: R and SQL; machine learning models and data mining techniques (data mining) for the creation of predictive systems, recommenders and classification systems. An overview of probability, discrete and continuous random variables, distributions, correlations, regression, and other statistical techniques will also be provided.

Ethics and Democratic Culture

This course aims to provide a context on how Artificial Intelligence and data misuse are impacting society, including unfair bias, surveillance and breach of privacy. It seeks to analyze different scenarios identifying risks for people, as well as to rethink improvements to develop possible solutions. The focus will always be on how we could be more ethical, legal and secure when working with data and technology.

Data visualization design and creative technologies

Data visualisation is a language, and like all languages it has precise code, but it also has flexibility for creativity. In this subject, we will study how to convert quantitative variables into visual attributes, graph grammar, composition, information aesthetics, interaction design and information design. It is a pencil and paper subject involving case study analysis and debate, designed to complement data visualisation programming.

Cartography and visualisation

A considerable amount of public data emanates from the geographies inherent to the administrative territory itself. This course

introduces the many uses of mapping to explore and reveal spatial patterns. It will cover everything from map design to data management and representation, geostatistical techniques, and emerging web technologies that have revolutionised geographic information systems.

Workshops I, II and III

Each workshop will consist of the elaboration of a project, carried out with one of the collaborating entities (public or private) of the Master's Degree.

All the workshops are independent, which means that a project cannot be started in Workshop I and be continued in Workshops II and III. The skills necessary to develop the projects must be complementary. Therefore, they will only have to fulfil one or two parts of the visualisation process.

Starting with a brief introduction and a prototype, students will work online and in groups. In an intensive face-to-face session (hackathon mode), the final result of each project will be presented and evaluated.

Final project (TFM)

The TFM must comply with the entire visualisation process: from the search and collection of data to database management, transformation, analysis, evaluation and visualisation.

Due to its longer duration, the face-to-face part will consist of two intensive sessions (hackathons) in order to present and evaluate the completed work.

An example of a TFM would be the following: 'US-led airstrikes against Islamic State in Syria and Iraq' report. The newspaper kept the database updated for a year. The software was written to detect new releases posted on the operations website of the United States Department of Defense, extracting the locations and dates of the bombings from the text of these reports. The software also alerted a group of reporters, who checked and approved the extracted data. Once the information was verified, the data was automatically passed to the dataset, which updated an interactive display of the extracted data.

Qualification

Màster de Formació Permanent en Visual Tools to Empower Citizens by the University of Girona*

* It does not include the issuance rate of the title.

Teaching and Assessment

The subjects will combine different methodologies: flipped classroom, online materials proposed by the invited speakers (professionals of recognised prestige from the media or public administration bodies), case-study presentations, etc.

The students will be organised in rotating teams of three people, in order to replicate the collaborative work typically found in companies or institutions.

The practice part of the Master (the most significant part of the methodology) takes the form of a laboratory where students will have to design and develop real projects for public administration bodies, research institutes, interactive media teams (news apps), and/or public agencies (national and international).

Online communication and participation between teachers and students will be conducted through communication channels such as Slack or Moodle.

Evaluation system

The method of continuous and collaborative assessment (staff, colleagues, teacher and mentor) will be used. The collaborative

dynamics in the classes and the contributions in the online and face-to-face sessions will also be observed.

The overall attitude and activity set of the student will also be evaluated.

Master's Final Project.

At least 80% of the videoconference sessions must be attended.

Scholarships

Mobility scholarships can be applied for by students living outside Girona.

Financing

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Bank financing

Enrolled students can pay in installments.*

The Fundació has agreements in place offering preferential terms for their students with the following entities:

- [Sabadell Consumer](#)
- [CaixaBank](#)
- [Banco Santander](#)

* Only applicable to persons resident in Spain and upon acceptance by the bank.

Financing through the Agència de Gestió d'Ajuts Interuniversitaris i de Recerca (AGAUR)

With the aim of facilitating access to Masters and Postgraduate courses, the Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR) promotes the following loan programme.

For more information, click [here](#).

Teaching table

Management

Karma Peiró

Transparency, accountability, ethics, and democratic culture

Karma Peiró is a journalist specialising in Information and Communication Technologies (ICT) since 1995. She has worked for the main Catalan public and private media outlets, such as La Vanguardia, TV3 or Catalunya Ràdio. She has also served as the director of the leading online newspaper in Catalan, Nació Digital. Her areas of interest include ethics, artificial intelligence, transparency and data activism.

Xaquín Veira González

Data visualization design and creative technologies

Xaquín G.V. is a visual journalist and data visualisation expert. He has worked for El Mundo, The New York Times, National Geographic and The Guardian, where he led the Visuals team. His areas of interest include visual literacy, emotional data communication, and automation of visual narratives.

Coordination

Anton Bardera Reig

Data visualisation programming

Anton Bardera holds a degree in Telecommunications Engineering from the Polytechnic University of Catalonia (2002) and a PhD from the University of Girona (2008). He is currently an associate lecturer in the Department of Computer Science, Applied Mathematics and Statistics at the University of Girona. His main fields of research are image processing, visualisation, information theory, and biomedical applications. He has co-authored two books, several articles in indexed journals and papers at international conferences.

Teaching staff

Ricardo Baeza-Yates

Guest speaker

PhD in Computer Science. He is director of Graduate Data Science Programs (part-time) at Northeastern University (Silicon Valley) and Full professor in computer science at Universitat Pompeu Fabra. Adjunct professor at the CS department of the University of Waterloo, Canada. He is a member of the AI Advisory Council of Spain. ACM and IEEE fellow.

Anton Bardera Reig

Data visualisation programming

Anton Bardera holds a degree in Telecommunications Engineering from the Polytechnic University of Catalonia (2002) and a PhD from the University of Girona (2008). He is currently an associate lecturer in the Department of Computer Science, Applied Mathematics and Statistics at the University of Girona. His main fields of research are image processing, visualisation, information theory, and biomedical applications. He has co-authored two books, several articles in indexed journals and papers at international conferences.

Apple Chan-Fardel

Guest speaker

Apple Chan-Fardel is an engineer specialising in data visualisation, the creation of user interfaces (design and experience) and machine learning. Between 2015 and 2017, she worked as a data visualisation developer at The Guardian in London. Her projects included being at the forefront of developing the internal visualisation tool.

Marc Comas Cufi

Statistical programming

Marc Comas holds a degree in mathematics from the Autonomous University of Barcelona and a PhD in statistics and compositional data analysis from the University of Girona (UdG). He currently works as a statistician within the research group of Epidemiology and Vascular Health Research of Girona. He is also an associate lecturer in statistics at the UdG.

Artur Galocha

Guest speaker

Artur Galocha is a designer, graphics editor, journalist and illustrator. He's currently a Graphics Editor at The Washington Post. Previously, he worked at El País, Público, El Mundo, Corriere dello Sport and El Correo Gallego. He has been Art director for several publications such as Tentaciones and Cambio16. He is also co-founder of the Retina and Líbero Magazines.

Carla Garcia

Cartography and visualisation

Carla Garcia is Geographer and has a master's degree in analysis and management of the global environmental change. Her PhD focused on the Catalan coastal systems: their historical evolution and their status. She works at SIGTE (Geographical Information Systems Lab from University of Girona) since 2019 and she is professor in GIS at the Department of Geography of the same university since 2016.

Niko Kommenda

Guest speaker

Niko Kommenda is a reporter in the Visual Storytelling team, an interdisciplinary group of journalists combining data, design, coding and reporting skills. The team focus on projects where visual elements play an essential role in communicating the story, working on everything from investigations to explainers across the spectrum of news and features. Niko was previously a visual projects editor at the Guardian.

Matt Osborn

Open data engineering and systems architecture

Matt Osborn is a software engineer with a background in a range of disciplines, including extensive experience in data processing & analysis, data visualization, and interactive web design. He has worked on various web-based dataviz projects and spent some time at *The Guardian* where he worked on two UK general election live result trackers.

Karma Peiró

Transparency, accountability, ethics, and democratic culture

Karma Peiró is a journalist specialising in Information and Communication Technologies (ICT) since 1995. She has worked for the main Catalan public and private media outlets, such as La Vanguardia, TV3 or Catalunya Ràdio. She has also served as the director of the leading online newspaper in Catalan, Nació Digital. Her areas of interest include ethics, artificial intelligence, transparency and data activism.

Monica Ulmanu

Guest speaker

Monica Ulmanu is a graphic editor for The Washington Post. She joined the Post in 2018 from the Visual team of The Guardian, where she worked as an editor of special projects. She previously worked at Thomson Reuters, The Boston Globe and The New York Times.

Xaquín Veira González

Data visualization design and creative technologies

Xaquín G.V. is a visual journalist and data visualisation expert. He has worked for El Mundo, The New York Times, National Geographic and The Guardian, where he led the Visuals team. His areas of interest include visual literacy, emotional data communication, and automation of visual narratives.

Carlo Zapponi

Guest speaker

Carlo Zapponi creates data visualisations for the Cisco analytics team. Before that, he worked at The Guardian, Microsoft/Nokia and Frog Design. In his spare time, he co-authored Visualize News and Soccer. He is passionate about everything that mixes creativity, data and people. The management reserves the right to make changes to the teaching team if any of the teachers are unable to teach their subject for whatever reason, guaranteeing the same level of quality and professional status.

*Management reserves the right to modify the teaching staff, if necessary, to ensure the levels of quality and professional category.

Promoting entities

Fundació UdG: Innovació i Formació



Fundació ViT



Visual Tools to Empower Citizens

Start course: 05/10/2022

Last session face-to-face session: 30/06/2023

End course: 30/06/2023

Date closing assessment report: 14/07/2023

Informative Sessions

	Date	Time	Place
Informative session 1	25/05/2022	18:00	
Informative session 2	03/06/2022	14:00	
Informative session 3	15/06/2022	13:00	

Calendar

Date	Place	Start of morning	End of morning	Start of afternoon	End of afternoon
5/10/2022				16:00	19:00
6/10/2022				16:00	19:00
7/10/2022				16:00	19:00
13/10/2022				16:00	19:00
14/10/2022				16:00	19:00
19/10/2022				16:00	19:00
20/10/2022				16:00	19:00
21/10/2022				16:00	19:00
26/10/2022				16:00	19:00
27/10/2022				16:00	19:00
28/10/2022				16:00	19:00
2/11/2022				16:00	19:00
3/11/2022				16:00	19:00
4/11/2022				16:00	19:00
9/11/2022				16:00	19:00
10/11/2022				16:00	19:00
11/11/2022				16:00	19:00
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17/11/2022				16:00	19:00
18/11/2022				16:00	19:00
23/11/2022				16:00	19:00
24/11/2022				16:00	19:00
25/11/2022				16:00	19:00
30/11/2022				16:00	19:00
1/12/2022				16:00	19:00
2/12/2022				16:00	19:00
7/12/2022				16:00	19:00
9/12/2022				16:00	19:00
14/12/2022				16:00	19:00
15/12/2022				16:00	19:00
23/12/2022	Presentació de projectes 1er trimestre			16:00	19:00
11/1/2023				16:00	19:00
12/1/2023				16:00	19:00
13/1/2023				16:00	19:00
18/1/2023				16:00	19:00
19/1/2023				16:00	19:00

20/1/2023			16:00	19:00
25/1/2023			16:00	19:00
26/1/2023			16:00	19:00
27/1/2023			16:00	19:00
1/2/2023			16:00	19:00
2/2/2023			16:00	19:00
3/2/2023			16:00	19:00
8/2/2023			16:00	19:00
9/2/2023			16:00	19:00
10/2/2023			16:00	19:00
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2/3/2023			16:00	19:00
3/3/2023			16:00	19:00
8/3/2023			16:00	19:00
9/3/2023			16:00	19:00
10/3/2023			16:00	19:00
15/3/2023			16:00	19:00
16/3/2023			16:00	19:00
17/3/2023			16:00	19:00
22/3/2023	Presentació de projectes 2on semestre		16:00	19:00
23/3/2023	Sessió preparatoria háckathon		16:00	19:00
1/4/2023	1r workshop háckathon	09:00		19:00
22/4/2023	2n workshop háckathon	09:00		19:00
13/5/2023	3r workshop háckathon	09:00		19:00
3/6/2023	Háckathons TMF	09:00		19:00
10/6/2023	Háckathons TMF	09:00		19:00
25/6/2023	Háckathons TMF	09:00		19:00
30/6/2023	Presentació TFM		16:00	19:00