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| **Module description** | Human-Centered Artificial Intelligence: Introduction, Design & Interaction  The objectives of this module are to introduce students to human-centered artificial intelligence, its process and value in designing interactive computing systems. Starting from a human perspective; AI helping humans, and making choices with the user always at the center of the design and development process. After this module, students have developed an appreciation of the value to focus early on users’ needs and context in order to achieve better results when it comes to the fit of a technical system in people’s everyday lives. |
| Code: | HCAI1 |
| Title: | Human-Centered Artificial Intelligence: User Experience Design |
| Percentage: | 30 |
| Learning Goal: | The ability to design human-centered artificial intelligence applications. |
| Learning Objectives: | After the completion of this course, students can create basic prototypes by:   * understanding and applying the basic design principles of user-experience design; * understanding and apply the basic processes of user-experience design;   in the context of artificial intelligence. |
| Intended Learning Outcome: | **ILO 5. Design, Prototyping and Implementation:**  The student can develop a wireframe prototype for an application embedding a novel algorithm using various design techniques, iteratively testing his design and explicitly involving stakeholders in the process.  **Specifically, the student can:**  1) develop a wireframe prototype using various iterative testing methodologies, design techniques and processes;  2) explicitly involving stakeholders in the design and testing of application;  3) create a remote user test from his wireframe prototype;  4) design an appropriate user experience to facilitate artificial intelligence/data science applications;  5) design for and communicate about various disruptive technology risks;  6) justify design decisions using basic design principles of user-experience design.    Other competencies relating to the human dimension and caring related to Dee Fink’s model are covered by professional competencies and are reflected in ILO 1 & 2 in the file: 2021-22 ADS&AI Assessment Rubric Block C.    Dublin Descriptors: Knowledge & Insight, application of knowledge & Insight, Making Judgements.  The Dublin-descriptors referred to are agreed on at an EU level to demark the bachelor education level. These form the justification for handing out a bachelor degree after you finish the program.  Edison competencies: DSENG01- Data Engineering Skills, DSBA01 - Domain Related Competencies  Note: All of these competencies are assessed on beginner data scientist level of the [Edison Data science framework](https://edison-project.eu/edison/edison-data-science-framework-edsf/). Only Data Science Analytics and Research Methods and Project Management competencies were included. Having an S at the start of a code means applying competencies is required here, a K at the start of a code means only a knowledge competency level is required compared to its counterpart code (e.g. ***S***DSDA04 includes knowledge level of ***K***DSDA04). |
| Pre-requirements: | None |
| Approach: | Student-centered learning: Students will be taught using the github platform where they can access self-study material for Self-Study Days and Datalab material produced or curated by the lecturers.    Course load: 10 days consecutive days of Self-Study Days and Data Lab Days where:   1. Self-study day of (max) 8 hours course day, 6 days in total, structured as follow:  * Github instructions/Video-lecture for presenting and discussing the main concepts, using practical examples and online material: 1 – 4 hours * (Interactive) Excercises, at home with lecturer support: 4 - 6 hours  1. Data lab day of 8 hours, 4 days in total: Mini-project to apply material learned in preceding Self-Study Days to a use-case (their own deep-learning algorithm) by creating a wireframe prototype.   Students will use [Proto](https://proto.io/en/pricing/) as the prototyping tool for their application design and use the software to create and launch a remote user test of the created wireframe prototype for the client. Proto is a easy to learn prototyping tool which covers all essential wireframing features. |
| Topics by week: | |  |  |  | | --- | --- | --- | | **Week** | **Day** | **Topics & Activities** | | 7 | 1 | Interaction and information processing  fundamentals:   * Information and the user: Extended Mind Hypothesis & Network Enabled Cognition * High-Level Design Techniques: Design Thinking & Divergent-Covergent Design * Workshop High-Level Design of Application | | 7 | 2 | Responsible AI Datalab Discussion   * Peer-Review High-Level Design of Application * Discussion in groups: Risks & stages of disruptive technologies – Interactive lecture * GDPR checklist on high-level design of application | | 7 | 3 | Interaction design:   * Designing for user interaction * Design processes * Designing for AI interaction | | 7 | 4 | Interface Design: Build a wireframe - Building   * Interface design fundamentals * Wireframe: Install Proto * Proto.io tutorial: [Essentials 1-3](https://support.proto.io/hc/en-us/articles/226397468-Proto-io-Essentials-Episode-1) | | 7 | 5 | Datalab: Build a wireframe - Concepting   * Wizzard of Ozz workshop * Wireframe: Conceptualize a prototype | | 8 | 1 | Interface Design: Build a wireframe - Building   * User feedback * User testing * Wireframe: Make a vertical slice * Deploying the prototype | | 8 | 2 | Datalab: A/B Testing of Vertical Slice   * Introduction to A/B Testing * Groups: A/B Testing of peers of vertical slice | | 8 | 3 | Development integration of AI algorithms:   * Learning and adaptation * Labelling * Confusion Matrixes   Build a wireframe – Horizonal Slice   * Build a horizontal slice prototype | | 8 | 4 | Work on wireframe:   * Lecturers available for feedback and formative testing * Test the menu flow & interaction with your peers | | 8 | 5 | Datalab: Finalize App and User Experience   * Record X amount of user tests | |
| Assessment: | **Formative Assessment:** On the datalab days, the students are asked to informally present their ideas and work to the lecturers in order to receive feedback and potential redirections.  **Summative Assessment:** In week 9 the student will host a live demo (online or offline) of the wireframe prototype created of the app where the lecturer will act as the client to which the app is demonstrated to. The wireframe will be assessed on the user-experience and the value created by the app.  User-experience defined as:   * Interaction flow * Interaction quality * Intuitive user understanding (of presented data & interactions)   Value defined as:   * Client appreciation * Useful features * Holistically effective for the target audience * The value of the data analysis to the features * Management of disruptive technology risks   The student will have to supplement his design decisions with arguments using basic design principles of user-experience design upon client inquiry. |
| Literature/Resources: | Recommend Literature:   * [Interaction Design: beyond human-computer interaction](https://login.proxy1.dom1.nhtv.nl/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cat01829a&AN=buas.303541695&site=eds-live) * [UX Fundamentals for Non-UX Professionals : User Experience Principles for Managers, Writers, Designers, and Developers](https://login.proxy1.dom1.nhtv.nl/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=edsebk&AN=1892077&site=eds-live)   Further Reading:   * Designing with Data <http://shop.oreilly.com/product/0636920026228.do> * [The Design of Everyday Things,](https://login.proxy1.dom1.nhtv.nl/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cat01829a&AN=buas.393706974&site=eds-live) |