Summary of mini-project in the Human-Machine Communication course

The AUCTIONS system is a modern application that supports the integrated management of art auctions in real time. The basic stages in conducting an art auction are recorded in the online encyclopedia Wikipedia: https://en.wikipedia.org/wiki/Art_auction. It should be noted that the developers of AUCTIONS are looking forward to a service that will progressively support complex features related to the history of auctions conducted by various houses, the analysis of data on works of art that are available for auction and/or have been auctioned, as well as art collectors who express interest and participate in the auctions. However, in its initial version, the AUCTIONS system must correctly support the following processes:

- ***Artwork inventory management***: This is the process whereby artwork by specific artists is registered with AUCTIONS (by certified auction houses that undertake to organize auctions) and can then be included in an auction. AUCTIONS specializes in specific categories of artworks, which may be expanded over time. Each category of artworks is identified by a unique category code, a description of the category, and a web link. It should be noted that many works of art may belong to a category, but at any given time, a work of art registered with AUCTIONS is classified in only one AUCTIONS category. Artworks registered in AUCTIONS (with a unique code, title, description, year of creation/manufacture, and a photograph) are included in a catalog, and their details (see above) can be retrieved from an external "ARTS" system using an appropriate API. Data on the artists who created the works (such as the artist code, the artist's name, their nationality, a short biography, and a web link to the artist's website) can also be retrieved from the "ARTS" system.
- ***Creating an auction***: An AUCTIONS auction is created by a certified user filling out an online form that registers the details of the new auction and the artworks that will be auctioned. A new auction is identified by a unique auction code, its theme name and title, a brief description, the date and location of the auction, and the auction's web link. Once the auction has been created and within a specified time (e.g., one week), the auction creator can declare the works of art to be included.
- ***Registration of interested parties in an auction***: AUCTIONS displays the available auctions publicly so that any interested party can submit an electronic application to participate within a specific time limit. The application contains the following information: Tax Identification Number (TIN), Social Security Number (SSN) of the interested person and a statement of interest (up to 10 preferences) for projects being auctioned. Two verification procedures will precede the registration of the application. First, a check will be made to see if an application has already been registered in the AUCTIONS system with the same TIN and SSN, and then the user will be allowed to submit their expression of interest and preferences for the auction projects. These preferences will feed into an algorithm that will calculate the starting price of the project at the start of the auction. The first check will be performed locally by the AUCTIONS system, and if it is found that an

application with the same TIN and SSN has already been registered, the application process will be terminated, and a relevant message will be displayed to the interested parties. Otherwise, a preference check will follow, where the AUCTIONS system will send the information system "StartingPrices" the necessary information from an expression of interest to be taken into account when determining the starting price of the project in the auction and the auction step (i.e., the minimum amount of reduction for each bid).

- ***Real-time bid negotiation***: Participants submit bids for a project that is in the auction process. Specifically, at the start of the auction, the auction coordinator activates the projects participating in the auction by displaying the starting price, the current bid, and the time it was submitted, as well as the submission of a new bid (based on the auction step). Bids are submitted in real time and any simultaneous bids are routed using an appropriate algorithm so that all participants remain synchronized while the project is being auctioned. If a bid is submitted five minutes before the end of the negotiation, an extension of another 5 minutes is (automatically) granted. At the end of the auction, the auction coordinator locks the current auction price of the project and, if there is a highest bidder.
- Issuing an electronic artwork reservation coupon: After a work is auctioned, if there is a highest bidder, an electronic coupon is automatically issued and a 16-digit identification code is sent to the highest bidder (via SMS). The highest bidder must visit the AUCTIONS system and, after selecting coupon activation from the main menu, must enter the unique 16-digit identification code that has been assigned to them. If everything is done correctly, the AUCTIONS system displays the electronic coupon on the screen (in pdf format) and allows it to be printed; otherwise, it returns a failure message.

Scope of the project

The above is a draft description which can suitably enhanced, extended and/or expanded by students to accommodate their own interests. Whatever the focus chosen students should demonstrate some skills which are briefly summarized as follows:

- Requirements analysis by establishing a small set of scenarios to further detail the descriptions presented earlier
- Prototyping skills using a suitable platform such as Figma to depict low-level mockups of the UIs implicated in the chosen scenarios
- Basic UI design and development skills using a library / frontend platform of your choice to build the UIs

Important note: Backend functionality or advanced programming skills are of no relevance to the mini-project. Students undertaking this work should show UI design- and rapid prototyping-oriented skills.

Deliverables and assessment

Your work should be uploaded to eClass and should be presented in class at a time to be arranged with the instructor. This work should focus exclusively on user interaction with the system without worrying about the functional parts of the service (backend). Deliverables include (a) the scenarios developed and documented appropriately using tools such as use cases models and sequence diagrams (b) the mockups developed using a suitable prototyping platform such as Figma and (c) the live demo and the presentation of the final UI. Your deliverables will be presented in class and the final grade will be based on the range of design issues addressed, the quality of the results and the presentation given in class.