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City University of Hong Kong

Creating Interactive Infographics: The Integration of Data Science and Creative Expression

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Principal Investigator: Dr. Ayoung SUH

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Abstract:

This project is intended to cultivate students' creativity in developing and designing interactive infographics by combining data analytics and artistic expression. Students often find it difficult to analyze and interpret large amounts of data. In particular, art students with relatively little training in science-related subjects tend to easily lose the motivation to learn about data analytics. Even though students generally have good analytic skills, they often neglect their visual literacy-the ability to evaluate, apply, or create visual representations with creative expression. Therefore, integrating visual literacy into data science is becoming increasingly important to present data in both an engaging and intelligible way. Information visualization based on creative expression significantly enhances human cognitive abilities to understand data and information. The PI therefore proposes this project to support the teaching contents of the following courses: SM3801 (Information and Representation) and SM3802 (Scientific Processes).

The field of infographics refers to the graphic visual representation of data which is intended to present information quickly and clearly. Interactive infographics enable interaction between the content and the audience, providing far more information than a static infographic. Creating interactive infographics is a highly promising strategy to arouse students' creativity and interest in analyzing quantitative data with visual literacy. Aligning with the goal of the DEC curriculum, this project seeks to motivate students to better understand how statisticians, data scientists, and artists explore the concepts and methods of information visualization by allowing them to explore the utility of creating interactive infographics as a means of understanding society. Students will be guided in the process of learning basic data analytics techniques and visualization methods



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such as 2D and 3D visualization and interactive dynamic visualization. In addition, by using diverse public datasets (e.g., energy consumption, air quality, poverty, wealth/gender inequality, infant mortality, health development, social networking), they will be encouraged to analyze large quantities of data containing diverse social, cultural, and technological issues. By not simply being required to display the results of analysis, students will be tasked with more deeply understanding what the results imply by creating their own visualizations using infographics tools. The PI will lead students to understand the mechanisms underlying the general design process and aesthetic aspects of visualization that influence human cognitive capacities to process information. Many real-world infographics applications used across various industries (e.g., news media, e-commerce, education, and medicine) will be demonstrated, and the efficacy will be evaluated by students in class.

By applying knowledge of data science to infographics, this project aims at achieving the following objectives:

- (1) To assist students in developing various visual representation techniques and learn the essential concepts of different visualization theories;
- (2) To help students enhance their critical thinking capabilities so that they can analyze the design components and the impact that they have on individuals' cognitive responses to the information presented;
- (3) To encourage students to generate creative ideas and develop their own visualizations using interactive infographics by combining analytic techniques and artistic expressions;
- (4) To create an online archive for datasets and course materials that can be shared with anyone who is interested in infographics.

To achieve the goals proposed, a series of workshops on infographics will be structured into the course plans. In the workshops, a range of data analytic software and tools will be introduced to enrich students' capabilities to explore new possibilities of information visualization and its application. Industry experts from the news media and commerce industries will be invited to inform the students about current trends and applicability of infographics. As an outcome of this



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project, students will be expected to complete their visualization projects by creating their own interactive infographics that showcase how they can combine their analytic skills and visual literacy in a final presentation.