The 1st International Workshop on Data & Design Education and Practice: Changing behavior through data-driven design (DDEP 2024)

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1. Topic and motivation

In today's rapidly evolving industrial landscape, data-driven design stands as a transformative force, shaping innovation and directing the trajectory of technology and business [1]. Data-driven design is the practice of making design decisions based on data science or algorithms rather than intuition or personal preference. It involves an ongoing commitment and a deep understanding of the value of data. In this approach, the entire design process is structured around obtaining and analyzing research, ensuring that data plays a central role in informing and guiding design choices [2-4].

Recent years have witnessed a surge in interest in data-driven design, driven by the exponential growth of data. Organizations are increasingly recognizing the unparalleled power of data to gain insights, make informed decisions, and create products and services aligned with user needs. It has potential to optimize user experiences, streamline operations, and fuel product innovation.

A particularly compelling facet of data-driven design lies in its potential to effect personal change, influencing habits and behaviors that underpin individual and societal well-being. This dimension of data-driven design holds immense significance in addressing pressing challenges, such as public health, environmental sustainability, and overall quality of life [5]. This proposal explores the captivating realm of data-driven design and its significant applications, particularly in fostering habit and behavior change.

As an adjunct workshop of the 19th International Conference on Persuasive Technology, our event serves as a complementary platform to the main conference, focusing specifically on the synergy between data-driven design education and behavior change.

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We will present case studies and best practices of data-driven education programs and its current and potential applications on driving meaningful change. Our goal is to provide a forum where researchers, designers, and industry leaders can converge, exchange insights, and chart a course toward a future where data-driven design becomes a catalyst for transformative habit and behavior change.

2. Organization

We will organize a one-day workshop that combines keynote speeches, individual research presentations and an interactive session. Below are the details of the workshop.

2.1. Scope

The scope of the workshop includes, but is not limited to the following topics:

- Data-driven design education program development and practices.
- ICT-based industrial and public space design for personalization, tailoring, goal setting, feedback monitoring.
- Design for Computer-Human interaction (including UI and UX design) for habit formulation.
- Design thinking and its applications in the smart city domain for group and individual behavior change.
- Design thinking and its applications on product development for habit formulation.
- Designing AI and AR service for behavior and lifestyle changes.
- Related Topics: While the above themes are central, we also invite contributions on closely related topics that explore the use of data and design in influencing behavior positively.

2.2. Organzing and program committees

- The fonts should now be installed. Prof. Yuichi Washida, Hitotsubashi University
- Prof. Minyuan Ma, National Cheng Kung University
- Dr. Michael Björn, Ericsson
- Asst. Prof. Tseng-Ping Chiu, National Cheng Kung University
- Asst. Prof. Nanami Furue, Hitotsubashi University
- Asst. Prof. Wenzhen Xu, Hitotsubashi University
- Ms. Ai Higo, Hitotsubashi University

3. Accepted Papers

This year's workshop featured five speeches and one hands-on session:

Opening Speech: "Enhance Students' Resilience: A Case Study in Educating Data Design Programs within Traditional Business Academia"

This opening speech presented a case study on the integration of data design programs into traditional business academia to enhance student resilience. It discussed the pedagogical adjustments and strategic implementations needed to foster resilience and adaptability among students facing the rapidly evolving business landscape.

Invited Speech 1: "From Design-to-Design Thinking: Enhancing Soft Skills in Education"

The first invited speech explored the transition from traditional design disciplines to design thinking approaches in education. It emphasized how design thinking fosters critical soft skills like creativity, problem-solving, and teamwork, which are essential for student success in contemporary and future job markets.

Invited Speech 2: "4,320 Hours in the Metaverse: How the Metaverse Shapes Our View of Reality"

This presentation delved into the immersive experiences within the Metaverse and its impact on our perception of reality. The speaker highlighted how extensive exposure to virtual environments is reshaping human interaction, cognition, and our understanding of digital and physical worlds.

Regular Speech 1: "The Relationship Between Individual Traits and CPE for Universal Creativity Education Program Design"

This talk focused on how individual personality traits influence cognitive processing efficiency (CPE) and the implications for designing creativity-enhancing education programs. It proposed tailored educational strategies that accommodate diverse cognitive and personality profiles to maximize creative outputs.

Regular Speech 2: "Adapting to Audiences: Strategic Alignment of Television Commercials with Viewer Attitudes in a Data-Driven Era"

The second regular speech addressed the strategic alignment of television commercials with viewer attitudes, underpinned by data analytics. The speaker provided insights into how data-driven strategies are revolutionizing advertising, making it more responsive to consumer preferences and behaviors.

Hands-On Session: "A Quick Start to Apply Design Thinking in Human-Computer Interactive System Development"

In this practical session, participants were introduced to applying design thinking principles in the development of human-computer interactive systems. The session included hands-on activities that covered all stages of the design thinking process, aimed at enhancing user-centered design practices.

References

[1] Chen, L., Wang, P., Dong, H., Shi, F., Han, J., Guo, Y., ... & Wu, C.: An artificial intelligence based data-driven approach for design ideation. Journal of Visual Communication and Image Representation, 61, 10-22 (2019)

[2] Jeong, S., Chiba, K. and Obayashi, S., “Data Mining for Aerodynamic Design space”, JACIC, Vol. 2 No. 11, pp. 452-469 (2005). https://doi.org/10.2514/1.17308

[3] Zhao, H. et al., “Application of data-driven design optimization methodology to a multi-objective design optimization problem”, Journal of Engineering Design, Vol. 18 No. 4, pp.343-359 (2007). https://doi.org/ 10.1080/09544820601010981

[4] Huang, Z. et al., “Optimal design of aeroengine turbine disc based on kriging surrogate models”, Computers & structures, Vol. 89 No. 1, pp. 27-37 (2011).

[5] https://doi.org/10.1016/j.compstruc.2010.07.010

[6] Asgari, M., Hurtut, T.: A Design Space for Visualization Onboarding in Data-driven Stories. OSF Preprints, 18 Oct. 2021. Web.

[7] Chiu T-P., Yang DJ., Ma M-Y.: The Intertwining Effect of Visual Perception of the Reusable Packaging and Type of Logo Simplification on Consumers' Sustainable Awareness. Sustainability,15(17):13115(2023). https://doi.org/10.3390/su151713115

[8] Ångström, R. C., Björn, M., Dahlander, L., Mähring, M., & Wallin, M. W.: Getting AI Implementation Right: Insights from a Global Survey. California Management Review, 66(1), 5-22 (2023)