Resume

About me

Name: QU Hong

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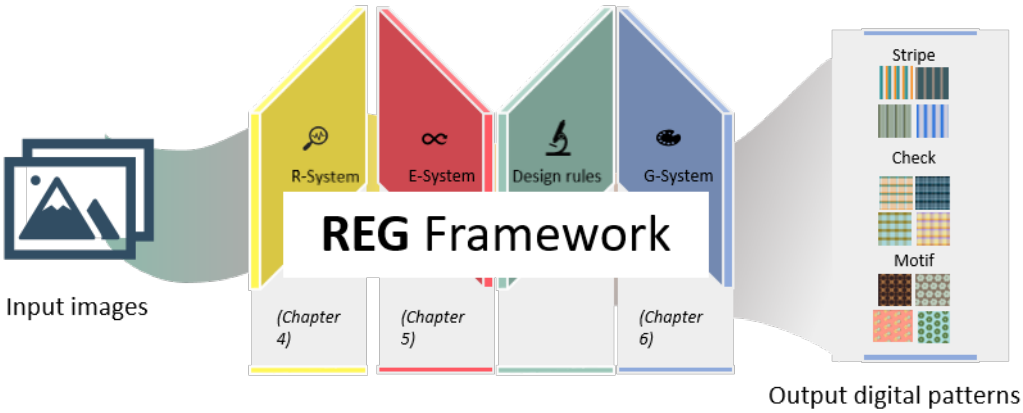
Research Directions

My research interests focus on the integration of Artificial Intelligence (AI) with design, particularly in the field of fashion. In my previous work, I explored the use of deep learning and computer vision techniques for assisting fashion design and decorative pattern design. Currently, my research is centered around the integration of AI with various fashion & design-related tasks.

Education

PhD. (2019/09 – 2023/04) The Hong Kong Polytechnic University | School of fashion and textiles (QS2023 #65)

Research Topic: Intelligent systems for digital pattern analysis and design support



This study proposes a new framework (the REG framework) for generating decorative patterns in the fashion industry using artificial intelligence. The framework consists of three intelligent systems: the repeated pattern detection system (R-system), the automatic design element extraction and vectorization system (E-system), and the vector-based digital pattern generation system (G-system). The systems analyze input images, extract useful design elements and rules, and generate new vector-based patterns that meet human aesthetic requirements. The proposed framework promotes the use of artificial intelligence for design generation, catering to the speedy fashion product development cycles.

Keywords: Fashion Computer-aid Design (CAD), Digital Pattern Analysis, Design Generation, Vectorization, Intelligent Systems,

Human Aesthetics

MA (2015/06 – 2016/06): The Hong Kong Polytechnic University | Institute of Textile and Clothing (QS2023 #65)

Major: Fashion and textile design

Design Project: Elementary Drape: Creating a minimalist fashion collection inspired by artwork and masters, using draping as a key element to bridge minimalism and fashion design.

Fashion Illustration

Fashion Images

B.Eng (2011/09 – 2015/07): Donghua University（Project 211）| College of Fashion and Design

Major: Fashion design and engineering

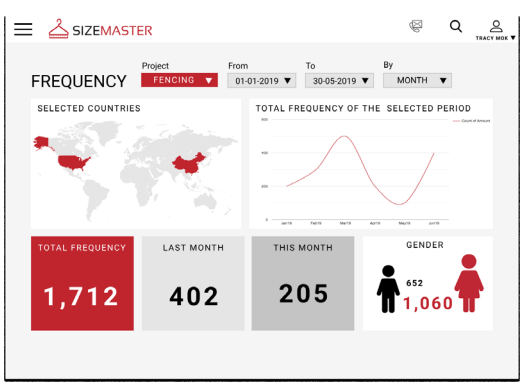
Research Topic: Study on the structure of the straight-front Shenyi in the Han Dynasty（汉代直裾深衣）

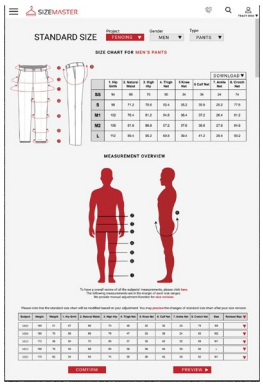
Work Experience

2018.12 – 2019.09： The Hong Kong Polytechnic University | Research Assistant

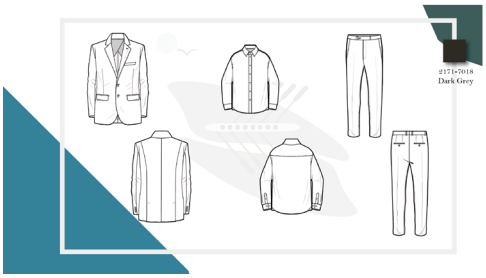
Support the completion of research projects within the group, involving a range of specific tasks, e.g. sample making, contacting factories, 3D body scanning and data processing, and graphic design work. Mainly involved in the following two projects:

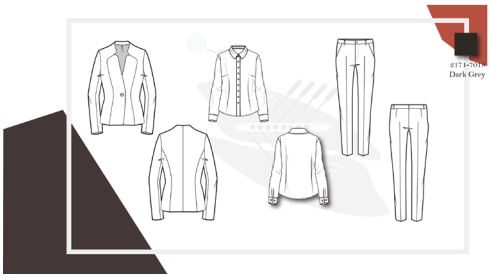
1. **(Participate)：** Intelligent Sizing and Somatotype Analysis Platform for Uniform Production
    - Participated in the development and functional testing of the system interface;
    - Completed the size recommendation prototype system.





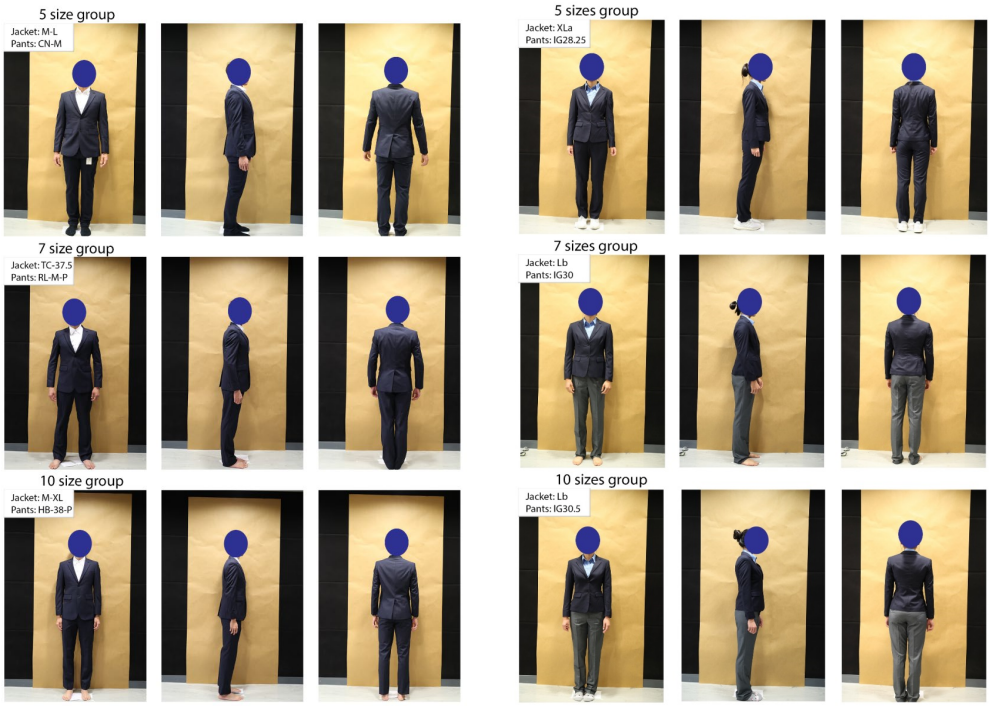
2. **(Participate)：** Trial: High-Performance Hong Kong Bespoke Men’s Suiting for an Updated Urban Professional Application and Image-based Precise 3D Human Model Customization on Smart Phones for Fashion Application (ITF: ITT/011/18TP)
    - Completed the design and prototyping of men's and women's uniforms;





    - Responsible for interfacing with factories to complete mass production of uniforms;

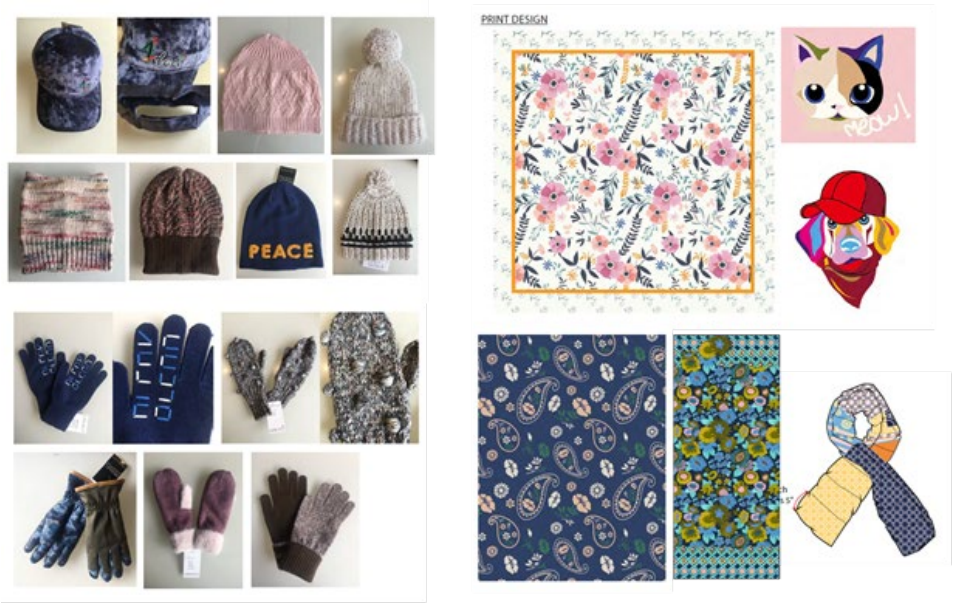
- Participated in 3D body data collection and wearing-trial experiments.



2017.08 – 2018.10: ONESTOP Co., Ltd. | Designer

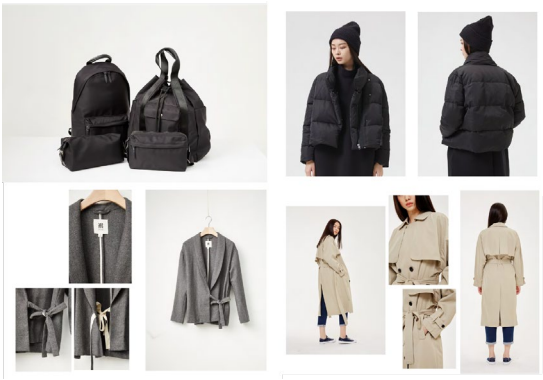
Creating and developing a variety of products for the American market, such as woven and knit scarves, hats, gloves, bags, and graphic designs. Selecting fabrics and materials, and overseeing the production process to ensure the final product meets quality standards.

- Successfully designed and launched 2019 in-house design in collaboration with two other designers, which received positive feedback from customers;
- Efficiently develop products for our customers (e.g. American Eagle, Aerie and JJill) according to their requirements and ensure on-time delivery of products.



2016.08 – 2017.08: METERSBONWE Co., Ltd. | Assistant Designer

- Provide support to the design team in various areas, such as fashion information collection, garment development sheet drawing, connecting with factories, and translation work.
- Work independently on accessory development, such as shoulder bags and handbags.



Teaching

Teaching assistant: Foundations of Apparel Construction (Lab class) **(64 hours)**

Description: Introduction to the various types of sewing machines and the production of basic garment components (zippers, slash pockets, straight skirts)

Academic Services

Reviewer for the International Textile and Apparel Association Conference (ITAA), the Fractals (SCI 1), and other journals and conferences related to fashion and textile.

Publications

Thesis:

[1] **Qu, H.**, Intelligent systems for digital pattern analysis and design support, Hong Kong Polytechnic University, 2023.

Conference Papers

[1] **Qu, H.**, Zhou, Y., Chau, K. P., & Mok, P. Y., Repeated pattern extraction with knowledge-based attention and semantic embeddings, 14th International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing, 2020.

[2] **Qu, H.**, Chau, K. P., & Mok, Detection of Repeated Patterns with CNN Activations and Similarity Matching, 1st ITC-KSCT Joint Symposium, 2022.

[3] **Qu, H.**, Chau, K. P., & Mok, P. Y., Design Elements Extraction Based on Unsupervised Segmentation and Compact Vectorization, 16th International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing, 2022.

[4] **Qu, H.**, Zhou, Y., Chau, K. P., & Mok, P. Y., Automatic design elements extraction and vectorization for design support, International Conference on Advances in Design, Materials and Manufacturing Technologies (ICADMMT), 2023.

[5] **Qu, H.**, Chau, K. P., & Mok, P. Y., Intelligent system embedding design rules for vector-based textile pattern generation, ITAA-KSCT Joint Symposium, 2023.

Journal Papers

[1] **Qu, H.**, Zhou, Y., Chau, K. P., & Mok, Efficient and Effective Detection of Repeated Pattern from Fronto-Parallel Images with Unknown Visual Contents, Under Review of Engineering Applications of Artificial Intelligence, 2023.

[2] **Qu, H.**, Zhou, Y., Chau, K. P., & Mok, P. Y., Recycling/Upcycling Graphic Design - Automatic Design Elements Extraction and Vectorization, Under Review of Computer-Aided Design, 2023.

[3] **Qu, H.**, Chau, K. P., & Mok, P. Y., Colour, layout, and fashion: generating aesthetically pleasing vector patterns for fashion design, under review of Textile Research Journal, 2023.

Skills & Certificates

- Pattern Making Certificates
- Mandarin Level 2A
- National Computer Rank Examination (Level 2)
- Adobe Illustrator & Photoshop
- Certificate in First-Aid Course (AFA)

• Experienced in Python and PyTorch framework, with a strong background in computer vision, image processing, and a deep understanding of Convolutional Neural Networks (CNN).

• Proficient in garment sewing pattern making, with a comprehensive understanding of the manufacturing process for garments and accessories (including woven and knitted materials).

• Experienced in using drawing software, with a passion for both graphic design and academic drawing. Proficient in Adobe Illustrator and Photoshop.