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TITLE: CREATION OF COLOUR-CHANGING SMART HOME TEXTILES VIA INNOVATIVE JACQUARD WEAVING

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ABSTRACT

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- The service system to maintain smart interior textiles is insufficient;
- A common set of standards defining methodologies, specifications, and best practices for various smart textiles applications is highly recommended;

HOWEVER: No systematic design process model has been established in order to achieve the specific innovative and functional aspects of colour-changing smart home textile products.

- This study aims to meet the challenging needs of future lifestyle and consumer requirements;
- Intelligent materials are able to provide a new array of sensorial qualities;
- Smart materials like thermochromic materials are developed for changing their colours in response to the changes in temperatures;
- The proposed colour-changing smart home textiles are able to bring both entertainments and communications to fulfil the future needs of the market.;
- Both of the textile industry and, fashion and textile design education could be profited;
- The developed high value colour-changing smart home textiles prototypes are able to utilize in different types of textiles products.

Keywords: Smart Home Textiles, Colour-changing, Jacquard Weaving, Smart Sofa Cloth, Smart Lamp Cover, Smart Glass Mat

Prototype A: Smart Sofa Cloth

- It illuminates in daytime and nighttime. The specific pressure sensor is integrated with the woven fabric and the pre-selected music will be automatically turned on when people sit on it.
- Pressure detection and amplifier are embedded.
- When it senses a pressure greater than 30lbs, it will send a specific signal to the amplifier which will be activated and the music will be started to play.
- Light detection
- It changes its colours when exposed to the light. It can absorb and store light / heat energy, then it will glow in the dark. It can be recharged and unlimited glowing. This fabric will become intensely coloured after 15 seconds in direct sunshine or light and return to clear after about 5 minutes indoors.

Prototype B: Smart Lamp Cover

- The woven fabric is applied with photochromic dye by using screen printing method. It is designed to save the energy power at home and create a ready-to-bed condition to let people turn it off an hour earlier before going to bed.

- Light detection

- When the light is switching on, the photochromic dye on the Smart Lamp Cover absorbs energy and it will illuminate and show the printed pattern on the woven fabric. The Smart Lamp Cover becomes intensely coloured after 15 seconds in direct sunshine or light and this effect will last for at least 3 hours after the light has been switched off.

Prototype C: Smart Glass Mat

- It does not require any electricity supply as the thermal material can provide colour-changing effect itself.

- Humidity detection

- When a glass of iced water is put on the Smart Glass Mat and the relative humidity is greater than 80%; the fabric changes from clear to red colour because of its thermal properties.

- Heat detection

- When it senses a temperature below 1°C, its red colour will start to change because of its thermal properties .
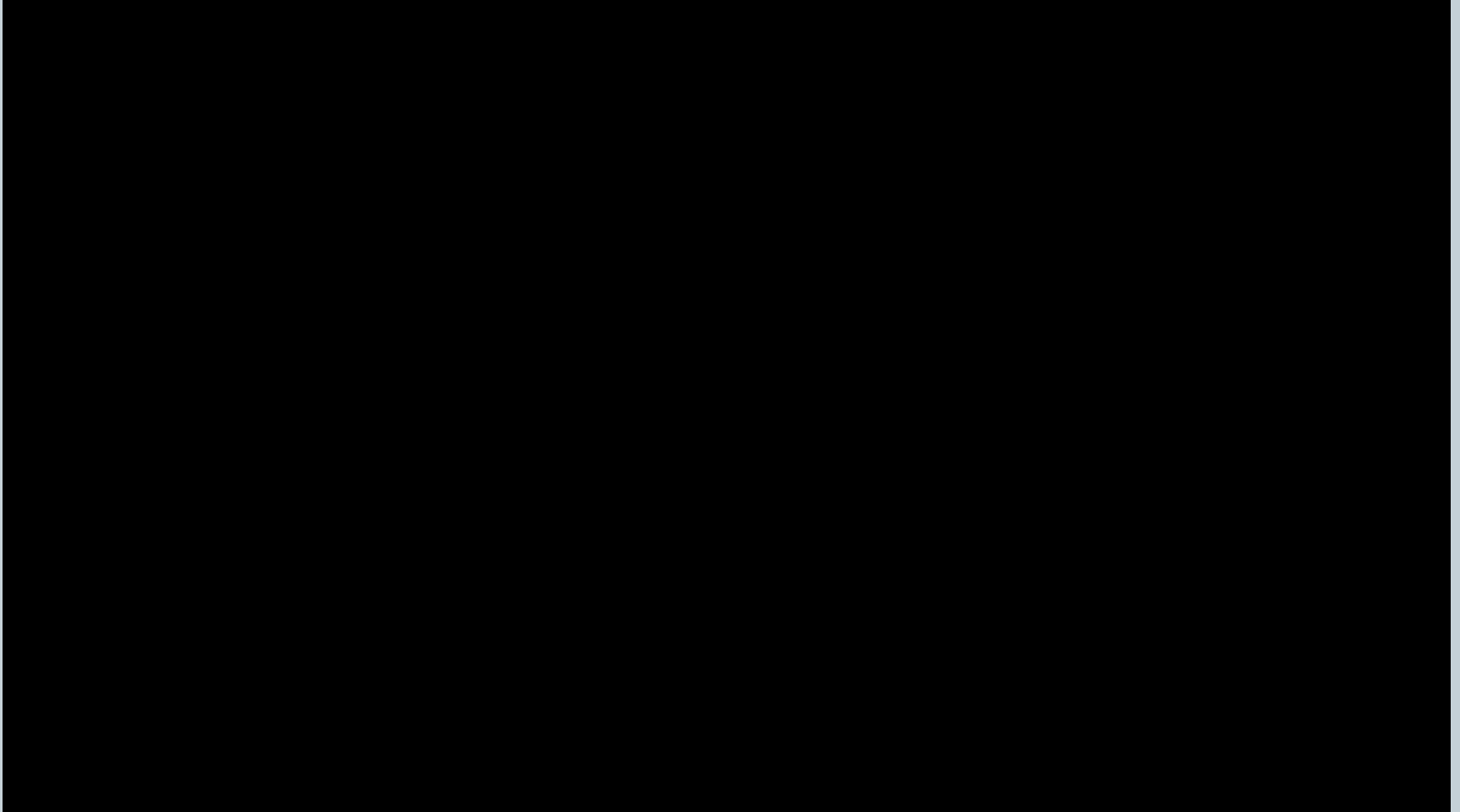
SMART TEXTILE PROTOTYPES

VIDEO CLIP

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Q&A

THANK YOU!