Designing e-textile sensors and actuators for infotainment interaction in cars

1. Summary

- Introducing a new design space for in-car interactions using e-textiles.
- Proposing a number of new applications for e-textile sensors and actuators including both the steering-wheel and back-of-headrest.
- Exploring non-driving related activities in future automated cars to broaden Human-Vehicle Interaction (HVI).

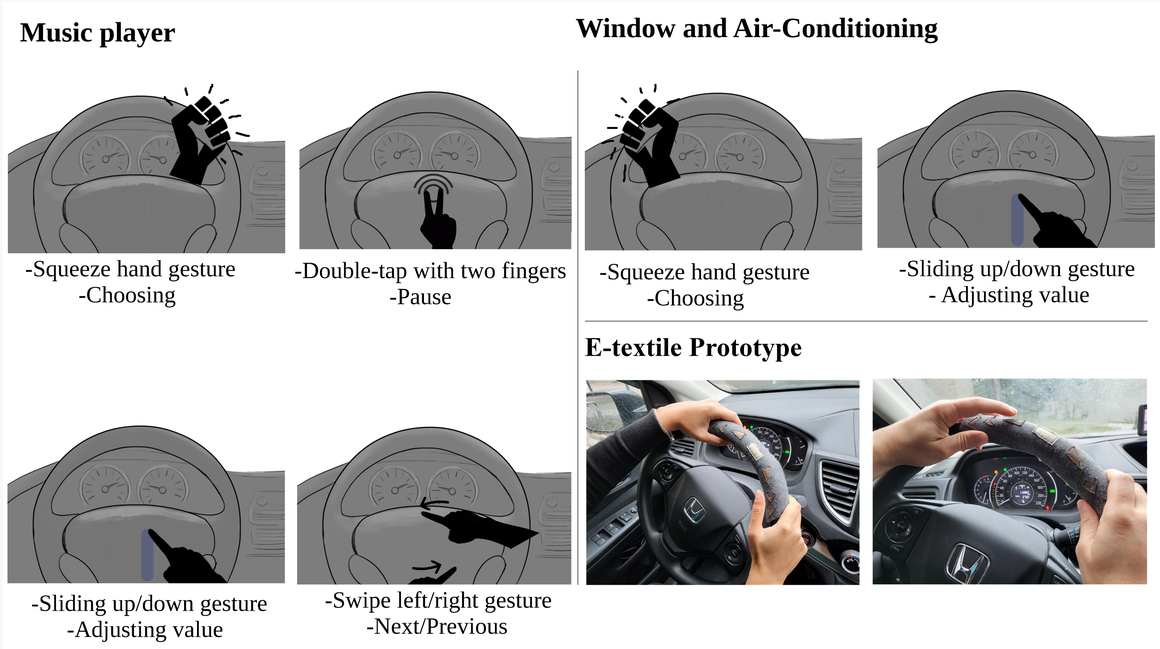
2. Motivation

- Car interior textiles are within the range of passengers' hands, they can be a great opportunity for in-car interactions.
- No prior work has explored this space as an opportunity for embedding e-textiles, transforming it into 'interactive fabric' for in-car interactions.
- Designing e-textile interfaces not only for drivers but also for 'passengers' that have been predominantly neglected in designing in-car interactions.
- Using e-textile interfaces, we can enhance their user experience in terms of experiential values and offer an excellent opportunity to embed seamless, less focus-demanding, playful interactions.

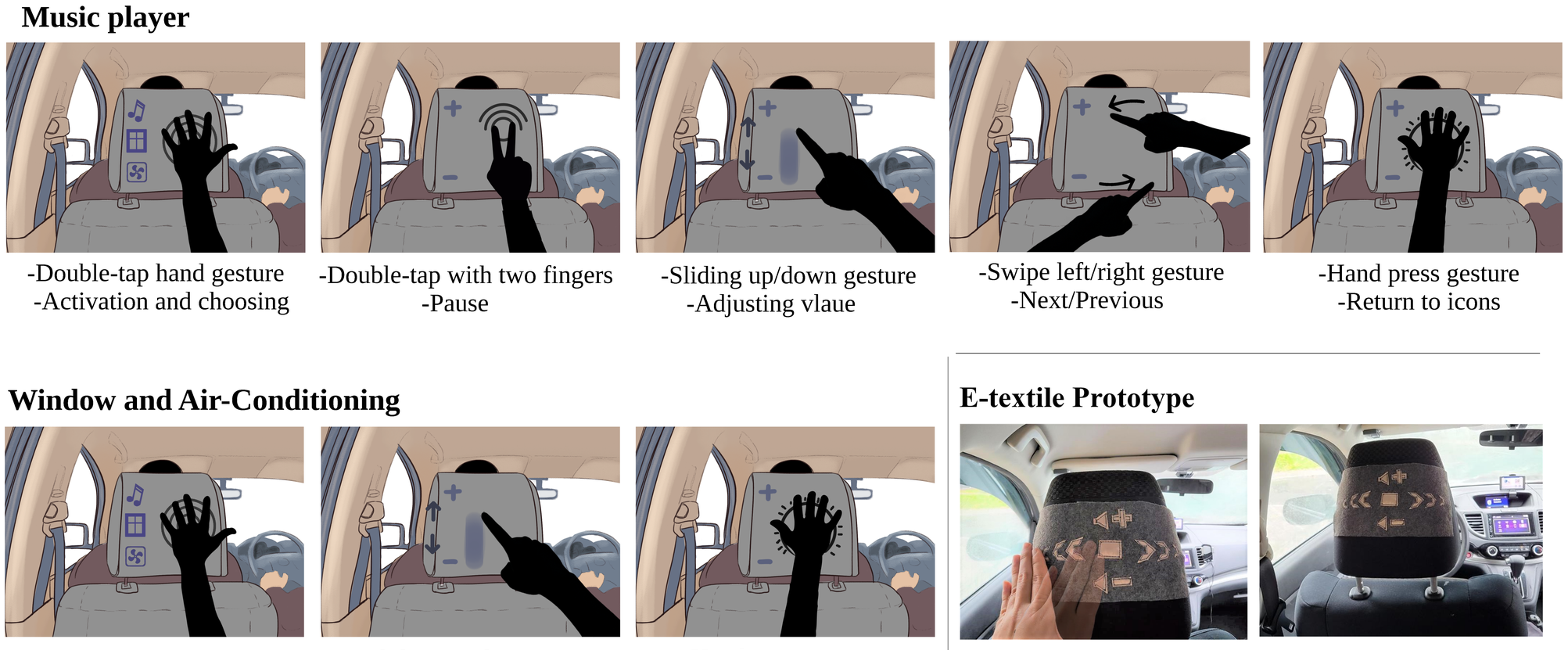
3. Sensing and actuation

- Using conductive/piezo-resistive fabrics, conductive threads and sewing machine, we have fabricated e-textile sensors to interact with music player, AC and windows by detecting surface and deformation gestures.
- With these e-textile sensors , we can have a fine-grained interaction without use of bulky buttons.
- Visual feedback can be integrated with usage of light-emitting textiles.

4. Steering Wheel E-textile Interaction



5. Headrest E-textile Interaction



6. Conclusion

- Introduced a number of novel applications of e-textile interactions seamlessly embedded within car fabrics or leather surfaces.
- Proposed e-textile input interfaces as tactile screenless means of controlling multimedia, windows and A/C inside the car.
- By highlighting the gap between the e-textiles and human-vehicle interaction (HVI) areas, we hope more research will be done in this area evaluating how people interact with and perceive such tactile e-textile applications.

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