

# DuoSkin: Rapidly Prototyping On-Skin User Interfaces Using Skin-Friendly Materials

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Miniature devices have become wearable beyond the form factor of watches or rings—functional devices can now directly affix to the user's skin, unlocking a much wider canvas for electronics. However, building such small and skin-friendly devices currently requires expensive materials and equipment that is mostly found in the medical domain. We present *DuoSkin*, a fabrication process that affords rapidly prototyping functional devices directly on the user's skin using gold leaf as the key material, a commodity material that is *skin-friendly, robust* for everyday wear, and user-friendly in fabrication. We demonstrate how gold leaf enables three types of interaction modalities on DuoSkin devices: sensing touch input, displaying output, and communicating wirelessly with other devices. Importantly, DuoSkin incorporates aesthetic customizations found on body decoration, giving *form* to exposed interfaces that so far have mostly been concealed by covers. Our technical evaluation confirmed that gold leaf was more durable and preferable when affixed to skin than current commodity materials during everyday wear. This makes gold leaf a viable material for users to build functional and compelling on-skin devices. In our workshop evaluation, participants were able to customize their own on-skin music controllers that reflected personal aesthetics.

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