Saving Skin: A Mobile Application for the Prevention of Skin Cancer, Using Risk Analysis

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The incidence of melanoma, the deadliest form of skin cancer, continues to rise due to ignorance regarding personal risk of melanoma development and regarding skin protection. I created a mobile application to educate the user on said risk and how to protect themselves from UV exposure. The application was created on MIT App Inventor and collects user input regarding skin tone, age, and location among other factors in order to sort the user into risk levels based on their cumulative risk of melanoma development. The app then produces personalized sun protection recommendations (i.e. which sunscreen to use, when to reapply) Oftentimes, sun protection factor (SPF) ratings are skewed and are misunderstood by consumers. Thus, the app's recommendations are based on a UV spectroscopic analysis of each sunscreen, detailing absorbance within the UV range. In conducting this analysis, I discovered which sunscreens absorbed the greatest amount of light within the UV wavelengths (280-400 nm) and their peak absorbance within this range. Based on this analysis, I then ranked each sunscreen so that the application recommends the best performing sunscreen to users with the highest risk of melanoma development. The application was tested against the recommendations of dermatological organizations utilizing a 15-user random sample and mirrored those recommendations with 100% accuracy. The code was redesigned by reducing the number of nested conditionals, improving efficiency. This application has international potential as well as commercial and healthcare applications, making it a viable choice for those who wish to protect their skin.

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