

Project Title	Removing skin colour bias in eczema severity scoring using image-to-image translation
Supervisor	Dr Reiko Tanaka
Theme(s)	Computational and Theoretical Modelling Medical Devices
Project Type	Desk based
Project Description	<p>Eczema is the most common form of skin disease. The eczema severity is currently assessed by trained clinical staff. However, the subjective nature of assessing these disease signs could be a source of significant inter and intra-observer variability. Our group recently developed EczemaNet, a prototype novel computer vision pipeline using CNN for automated evaluation of eczema severity from camera images (Pan, Hurault et al. 2020). EczemaNet was trained using the camera images that are predominantly from white skin with the under-representation of darker skin tones.</p> <p>This project aims to develop an AI tool to automatically detect the skin colour on each image and synthesise equivalent skin images of other tones of interest by image-to-image translation. Once the model learns the unique characteristics of an image collection (e.g. eczema on black skin) and figuring out how these characteristics could be translated into the other image collection (e.g. eczema on white skin), the model could synthesise an image of white skin from that of black skin and vice versa.</p> <p>The student is expected to review, implement, and validate the image-to-image analysis pipeline using off-the-shelf deep-learning and image analysis software packages for automated image-to-image translation of skin images.</p>