Interim Report: Death by Sun

New Mexico School for the Arts

What is the project about? (the definition of the problem)

Skin cancer is a leading cause of death in the US. According to the Office of the Surgeon General, roughly 9,000 people in the US die from Melanoma (which is one of the deadliest forms of skin cancer) each year. According to the National Cancer institute around 2.1 percent of people in the US will be diagnosed with Melanoma in their lifetime. Our team knows that more can be done to prevent skin cancer in the US. We are working to find a solution to help raise awareness of the damage of UV rays and prevent skin cancer before it is diagnosed.

Skin cancer is treatable once you are diagnosed with it. However, radiation treatment can cause many negative side effects including fatigue and pain (Siteman Cancer Center). Chemotherapy, another form of cancer treatment, can cause red and white blood cell count to be low, resulting in an increased risk for anemia and infection. It can also lead to nausea and vomiting and damage to nerves, causing numbness and pain in your hands and feet.

How are you/do you plan to solve this problem, computationally or by an app? (explain how it will look and what it will do)

Our team wants to investigate what factors have the greatest influence on skin cancer rates. We will then model these factors using object-oriented Python code and create a proposition to help protect people against skin cancer. Our team intends to simulate the global climate, the penetration of UV rays and see how different UV rays penetrate the atmosphere. Additionally we want to see what kind of effect UV Rays have on the skin. Our team will use these simulations to research and come up with prevention methods.

What progress have you made up to this point? (research, code, etc.)

At this point we have completed research pertaining to some of the most critical factors in determining an individual's risk including solar incidence angle (UV Index NASA) and Fitzpatrick Skin type (Barrington 2022). We have gathered several data sets of risk factors for analyzing our models. We are currently working on predictive models to help calculate an individual's risk, to encourage protective measures against skin cancer for those who are at risk. We will be comparing results from different types of models, and refining them to improve the effectiveness of the model. Some different types of models we will be comparing the results from are Random Forest, Support Vector Regression, neural Netwok models. We hope using multiple models will give us greater insight into the risk factors of skin cancer but all will help us determine the most effective predictive model.

What results are you expecting?

We expect to find that UV rays are more dangerous than the average person would think. Our team hypothesizes that we are going to see that people who are a one on the Fitzpatrick are more susceptible to damage by the UV rays than someone who is a three or five. We also expect to see a higher risk of skin cancer for people near the equator because there is more UV rays. We hope to make accessible individualized health information to determine risk for skin damage and cancer.

Works Cited

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