I. Problem statement
    A. This project aims to explore and develop image processing filters that can enhance the quality, aesthetics, and utility of digital images. It will focus on implementing and evaluating different filter techniques including spatial, frequency, and morphological filters to address specific image processing requirements. I will be focusing on creating filters that effectively improve image attributes and create entertaining transformations while minimizing undesirable distortions.
II. Context
    A. Digital image processing is only growing, and the creation and application of filters play a crucial role in enhancing and manipulating images for various purposes. Filters have wide-ranging applications in industries such as photography, entertainment, and scientific research. Completion of this capstone project will result in the creation of a robust and versatile set of image processing filters that can be applied in diverse domains. These filters will benefit professionals in industries such as photography, entertainment, and scientific research to enhance and manipulate digital images effectively, opening up new avenues for creativity and analysis.
III. Criteria for success
    A. Creating a website/app demo for individuals to personally upload their own images to apply the set of filters I have created through the use of image processing and filter algorithms and techniques.
IV. Scope of solution space
    A. The focus will be on creating filters that are capable of processing images in real-time while accommodating different image sizes and formats. Filters should be flexible and customizable to accommodate different image processing requirements that enable users to obtain the desired effects. While developing filters, a diverse set of datasets containing a variety of image types, resolutions, and quality levels should be evaluated and experimented on.
V. Constraints
    A. Some filters may have already previously been created and used.
    B. Computational resources may be limited: especially when dealing with large images or complex filters, processing power and memory can be limited.
    C. Noise and distortions: digital images are subject to different types of noise like random noise, blur, or compression issues. While developing new filters, I could lose important image details and create more distortions/noise.
    D. User Interface: Providing a website/app for users that are user-friendly could interfere with the application of the filters I created.
VI. Stakeholders
    A. Social Media companies (Instagram, TikTok, Snapchat, etc)
    B. Tech companies (AR creation companies)
    C. Photo editing software companies (Adobe, Figma, Canva, VSCO)
VII. Data sources
    A. https://www.topbots.com/step-by-step-implementation-of-gans-part-2/

B. https://www.kaggle.com/datasets/ashwingupta3012/human-faces
C. https://datagen.tech/blog/face-datasets/
D. https://www.kaggle.com/code/jihyeseo/npz-files/input?select=youtube_faces_with_keypoints_large_1