Project Design Phase-I
Solution Architecture

Date	19 September 2022
Team ID	PNT2022TMID27170
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

Example - Solution Architecture Diagram:

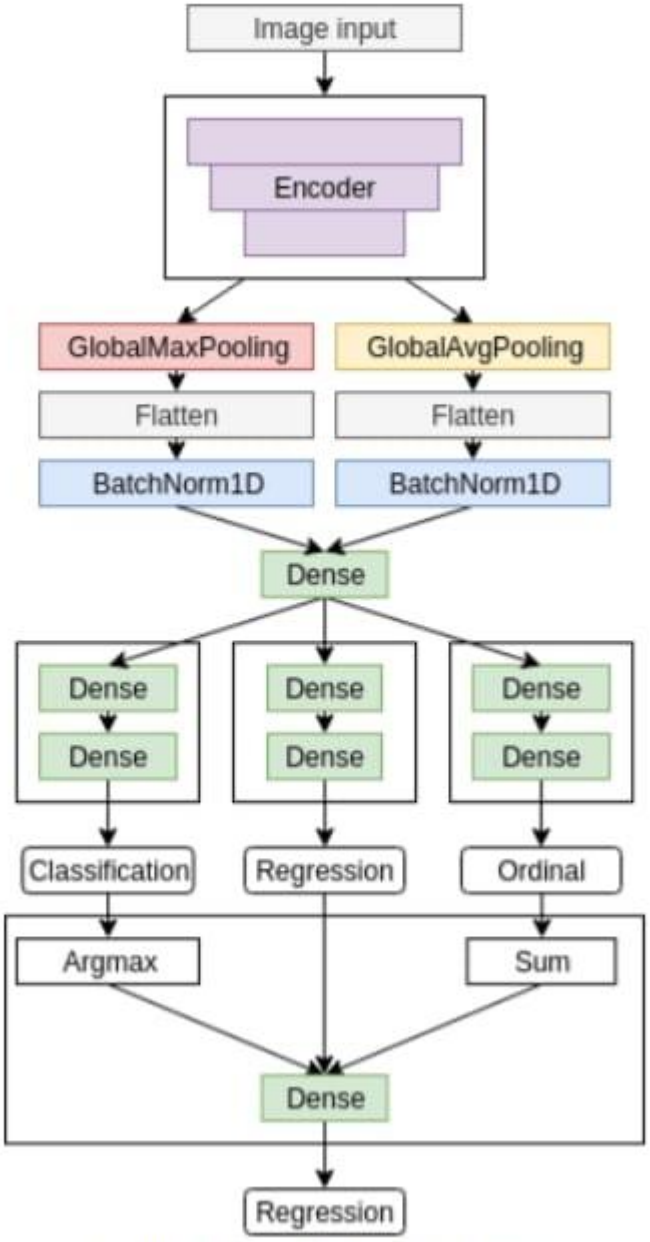

Figure 5: Three-head CNN structure.

***A good solutions architect looks at the existing environment and analyzes what technologies are available and what software product must be developed to provide the best solution for the problem that needs to be solved. From there, the solutions architect creates an overall strategic technical vision—not unlike an architect designing a blueprint for a building. They develop a budget for producing a software product based on that vision.**

*After the stakeholders have agreed on the project, the solutions architect is responsible for monitoring the process and keeping stakeholders updated and informed on the progress. Most of the time, the project involves both technical and non-technical stakeholders, and the solutions architect must make sure that each party's needs are considered an and factored into the project's scope.

*In the model training and subsequent primary validation, we used preprocessed versions of the original images. The preprocessing consisted of image cropping followed by resizing. Each image was cropped to a square shape which included the most tightly contained circular area of fundus.

*Moreover, we present what preprocessing and regularization steps to the images needs to be done for the good functionality of the deep learning system and investigate systematically how the size with much smaller number of images used in training affects its performance.

Reference: **https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-research-powered-by-ai-on-aws-part-1-architecture-and-design-considerations/**