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Thick Data Analytics for Learning Cataract Severity: A Triplet Loss Siamese Neural Network Model

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Abstract : Diagnosing cataract severity is an important factor in deciding to undertake surgery. It is usually conducted by an ophthalmologist or through taking a variety of fundus photography that needs to be examined by the ophthalmologist. This paper carries out an investigation using a Siamese neural net that can be trained with small anchor samples to score cataract severity. The model used in this paper is based on a triplet loss function that takes the ophthalmologist best experience in rating positive and negative anchors to a specific cataract scaling system. This approach that takes the heuristics of the ophthalmologist is generally called the thick data approach, which is a kind of machine learning approach that learn from a few shots. Clinical Relevance: The lens of the eye is mostly made up of water and proteins. A cataract occurs when these proteins at the eye lens start to clump together and block lights causing impair vision. This research aims at employing thick data machine learning techniques to rate the severity of the cataract using Siamese neural network.

Keywords : thick data analytics, siamese neural network, triplet-loss model, few shot learning
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