42. RECOGNISE A SCLERA VEIN USING PARALLEL APPROACH

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Sclera vein recognition is shown to be a promising method for human identification. However, its matching speed is slow, which could impact its application for real-time applications. To improve the matching efficiency, we proposed a new parallel sclera vein recognition method using a two-stage parallel approach for registration and matching. First, we designed a rotation and scale invariant Y shape descriptor based feature extraction method to efficiently eliminate most unlikely matches. Second, we developed a weighted polar line sclera descriptor structure to incorporate mask information to reduce GPU memory cost. Third, we designed a coarse to fine two-stage matching method. Finally, we developed a mapping schemeto map the subtasks to GPU processing units. The experimental results show that our proposed method can achieve dramatic processing speed improvement without compromising the recognition accuracy.

Index Terms—Sclera vein recognition, sclera feature matching, sclera matching, parallel computing, GPGPU.