ERROR ANALYSIS FOR CREATING 3D FACE TEMPLATES BASED ON CYLINDRICAL QUAD-TREE STRUCTURE

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Development of new biometric algorithms is parallel to advances in technology of sensing devices. Some of the limitations of the current face recognition systems may be eliminated by integrating 3D sensors into these systems. Depth sensing devices can capture a spatial structure of the face in addition to the texture and color. This kind of data is yet usually very voluminous and requires large amount of computer resources for being processed (face scans obtained with typical depth cameras contain more than 150 000 points per face). That is why defining efficient data structures for processing spatial images is crucial for further development of 3D face recognition methods. The concept described in this work fulfills the aforementioned demands. Modification of the quad-tree structure was chosen because it can be easily transformed into less dimensional data structures and maintains spatial relations between data points. We are able to interpret data stored in the tree as a pyramid of features which allow us to analyze face images using coarse-to-fine strategy, often
exploited in biometric recognition systems. © (2015) COPYRIGHT Society of Photo-Optical Instrumentation Engineers (SPIE). Downloading of the abstract is permitted for personal use only.

**Słowa kluczowe:** Algorithms; Biometrics; Cameras; Computing systems; Error analysis; Facial recognition systems; Sensors

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