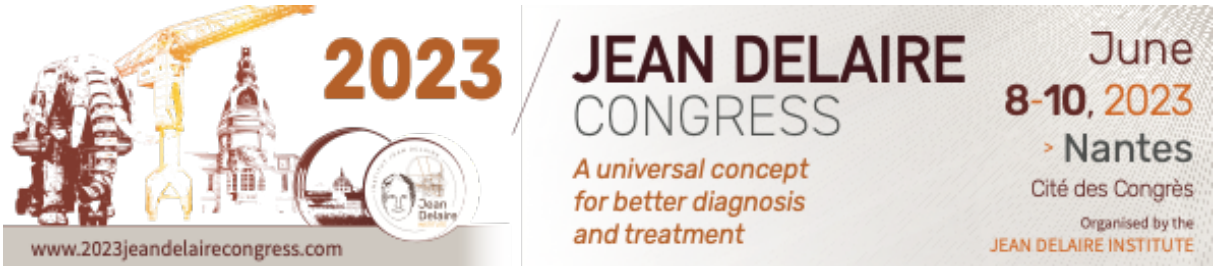

AI-based diagnosis and phenotype understanding in Craniofacial Microsomia (CFM) using 2D photographs

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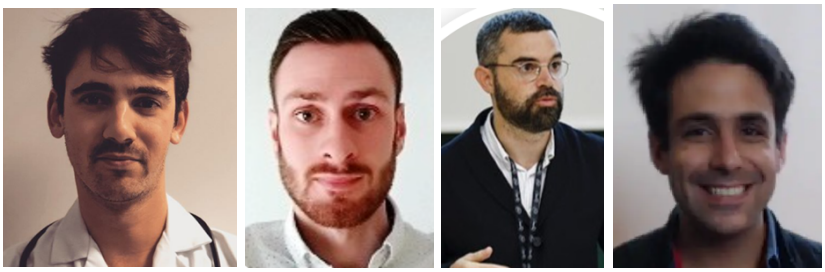

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Abstract :
Two to three thousand syndromes include facial anomalies. Their detection requires the experimented eye of an expert in dysmorphology. Here we present an innovative tool dedicated to the screening of abnormalities in children faces developed using a unique clinical photographic database.
The process was based on the automatic detection of landmarks, superposition of point clouds, dimension reduction and application of different classification algorithms. Our objectives were: 1) diagnose syndromes, 2) understand phenotypic features involved in diagnosis, 3) establish phenotypic differences within the same syndrome.
Craniofacial Microsomia (CFM) was used as an illustration of this process. The model allowed to predict the existence of extra-facial abnormalities based on frontal and facial 2D photographs.
Further application is currently being developed, involving the external ear, the eyes, the tip of the nose, and hair implantation.