

PATIENT SPECIFIC MATHEMATICAL MODEL FOR KERATOCONUS DISEASE

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Keratoconus (*KTC*) is an ectatic ocular disease characterized by a progressive thinning in corneal structure, that may result in a severe visual impairment. The early identification of *KTC* might help to reduce the expensive treatment costs and avoid corneal transplantation, however, the early identification of the condition remains a challenging task in clinical practice. This work presents a patient specific mathematical model, combined with a novel hybrid artificial intelligence algorithm, personalized with retrospective biomechanical and tomography measurements collected at Antwerp University Hospital (UZA, Belgium). The model describes the severity of the disease and identify early Keratoconus with an accuracy of 94.00% in the validation step. The results showed an important improvement compared with the available approaches in the literature (90.46%).

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