



Reconstructing Faces

A new application of mathematics allows surgeons to plan reconstructive facial surgery by analyzing various operative strategies implemented on virtual three-dimensional models. Previously, replicas constructed from CT-scans were used, which were expensive and allowed only one surgical strategy per replica. The new virtual models use geometry, partial differential equations, and numerical analysis to represent the movement of bone and soft tissue associated with different options, so that surgeons and their patients see the predicted results and choose what's best.

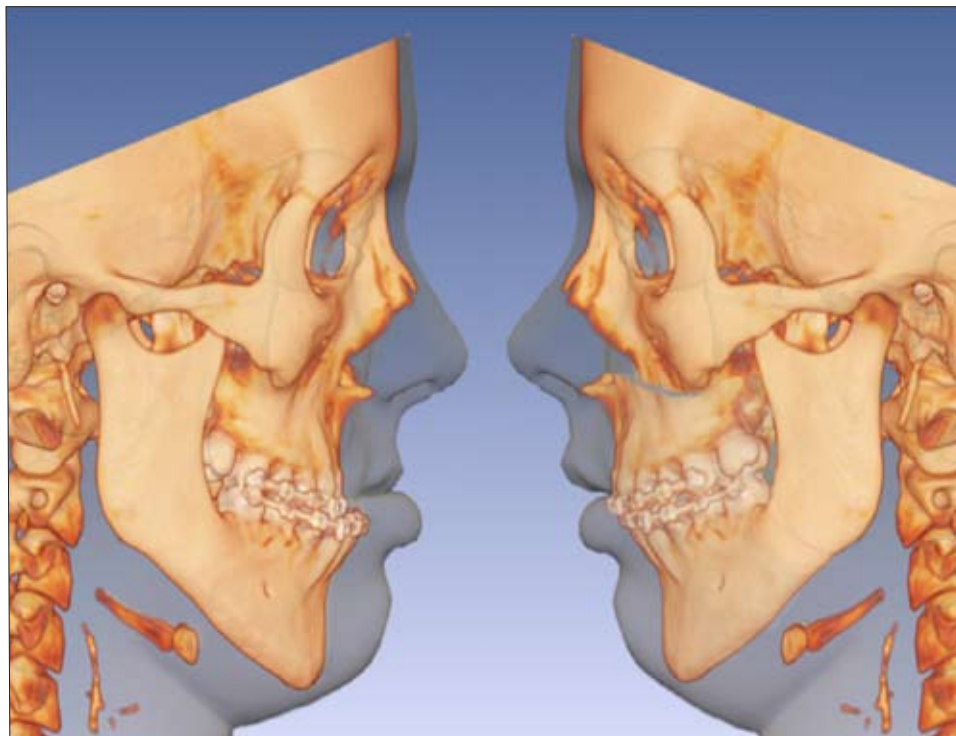


Image: A patient pre-operatively (left, reconstructed from tomographic data) and post-operatively (right, simulated), courtesy of Stefan Zachow, Zuse-Institute Berlin (ZIB).



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