

NOSE

Developing a 3D nose morphing tool that simulates the outcome of nose surgery based on easy-to-manipulate parameters

The NOSE research project put rhinoplasty center stage – i.e. plastic surgery for correcting and reconstructing the form of the nose, or for restoring its functions.

Currently, rhinoplasty surgeons primarily make use of (2D) facial images to inform their patients of which corrections are required and what the projected outcome will be. Their suggestions are typically based on 2D measurements and years of hands-on experience.

The NOSE consortium partners investigated how science and mathematics can help surgeons obtain even better results, while increasing the interaction with their patients. The team combined facial modelling statistics with intelligent morphing algorithms in a 3D tool to accurately simulate the outcome of nose surgery – based on a number of easy-to-manipulate parameters.

“NOSE aimed at creating a 3D nose morphing tool that takes the ‘average Caucasian nose’ as a baseline; an ‘average nose’ that is computed based on the characteristics of a couple of hundreds of faces in the NOSE database,” says Pieter Van Leemput (Nobel Biocare – Medicim), the project lead. “Secondly, we wanted to integrate in our tool a number of predefined parameters – such as the shape of one’s nose bridge, or specific nose dimple characteristics – and make those easy to manipulate. In other words, our ultimate objective was to provide surgeons with a user-friendly 3D tool that helps them to better visualize the outcome of a nose job.”

“In the course of the project, we saw that our approach raised a lot of interest in the domain of anaplastology too – a branch of medicine dealing with the prosthetic rehabilitation of absent body parts,” adds Peter Claes (imec - KU Leuven), who oversaw the project’s scientific research effort. “It appeared that our tool could be used in that field as well to ‘predict’ a whole new nose, and manipulate it afterwards.”



The outcomes

- Mathematical characterization of an average Caucasian face/nose, combined with algorithms that allow predefined nasal features to be changed on-the-fly
- Anaplastology : an unforeseen – yet successful – use case
- A 3D software demonstrator that brings all components together

NOSE Leaflet

[NOSE Leaflet](#)

NOSE (Nose Operations and Simulations Evaluated through ICT) is an imec.icon research project.

It ran from 01.01.2014 until 31.12.2015.

Project information

Industry

- Centrum voor Cranio-Faciale Epithetiek
- Nobel Biocare
- Medicim
- UZ Gasthuisberg
- UZ Gent

Research

- imec - PSI - KU Leuven
- imec - mintlab - KU Leuven

Contact

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