flowgy

Flowgy is a medical tool designed to
improve medical diagnosis
and nasal surgery

Summary

01

What is Flowgy?

Flowgy is a medical tool designed to improve medical diagnosis and nasal surgery by combining the most recent computational advances in fluid engineering and virtual surgery.

All the modules required for ENT practice are integrated and combined in a single tool to ensure maximum independence and efficiency of the ENT specialist.

We created Flowgy to help the ENT specialist achieve the best possible results in cases related to nasal obstruction, a common health problem with a failure rate of 25-50%. The methodology proposed by Flowgy, "Guided Nasal Surgery", based on Computational Fluid Dynamics (CFD) data helps the ENT specialist to improve the diagnosis and face the surgical process with the best guarantees.

02
The power of medical efficiency

Flowgy puts in your hands a single medical tool with all the necessary modules to perform from segmentations to virtual surgeries on 3D models generated from the analysis of CT images or similar. And all this from your own computer.

CT Display & Segmentation

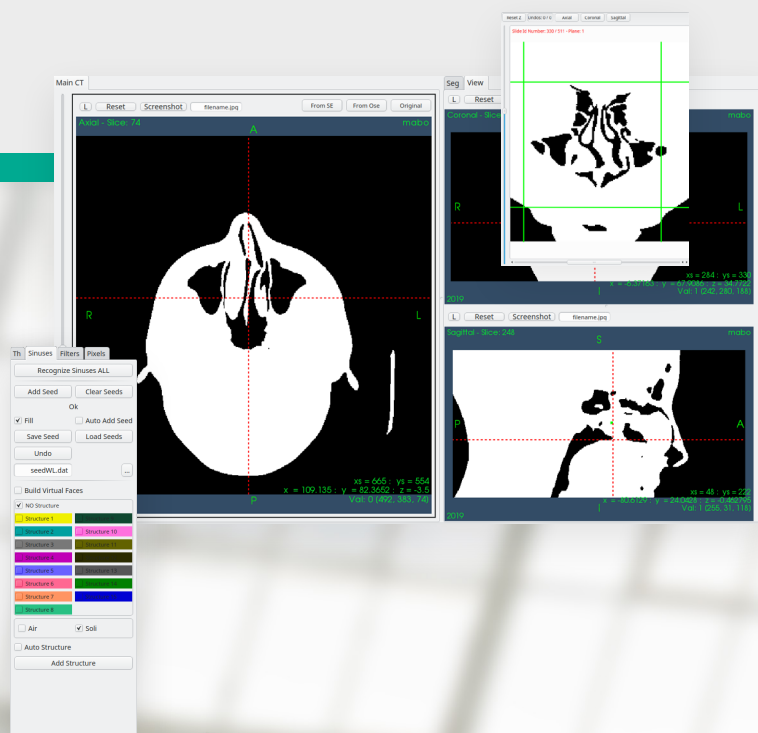Virtual Surgery

flowgy

Report

Solver

CT Display
& Segmentation

Using CT scans or similar images you can simulate and analyze, on your own computer, the different fluid flows in the nostrils.

Main Features

+ Support for concurrent, linked viewing, and segmentation of multiple images.

+ Manual segmentation in three orthogonal planes at once.

+ Computing distances and areas in CT images.

+ Automatic and selective identification of paranasal sinuses.

+ DICOM repositioning. Automatic repositioning of CT scans to ensure that anatomical structures remain in the same position for optimal analysis.

+ Support for many different 3D image formats (DICOM, NRRD, STL...)

Virtual Surgery

Operates in 2D or directly on a 3D model of the patient. It analyzes the surgical results in a precise and scientific way. Repeat the virtual surgery until the best option for the patient is found.

Main Features

+ 2D and 3D surgery (superficial or volumetric) synchronized with the CT scans.

+ Endoscopic and first person 3D view.

+ Creation and removal of tissue and air.

+ Structures. Flowgy allows you to add or create new structures on the 3D model for visualization and control during surgery.

+ Automatic generation of surface and volumetric CFD mesh of nasal cavity and boundaries.

Solver

Decide which CFD solutions should act on the anatomical structure and visualize their behavior in real time.

Main Features

- Different types of CFD solutions (laminar, compressible, inspiration and expiration)

- Different boundary conditions (flow rate, pressure drop, temperatures...)

- Visualization of the CFD solution and the residual convergence in real time.

- Unlimited number of stored CFD solutions.

- Display of flow fields (velocity, WSS, temperature, pressure and mass flow) and streamlines.

- Image capture and disk storage.
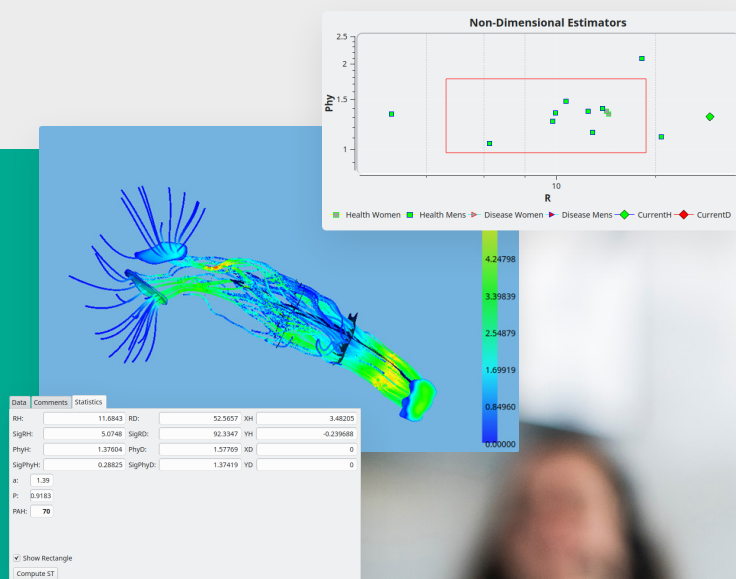
- Vector flow field display.
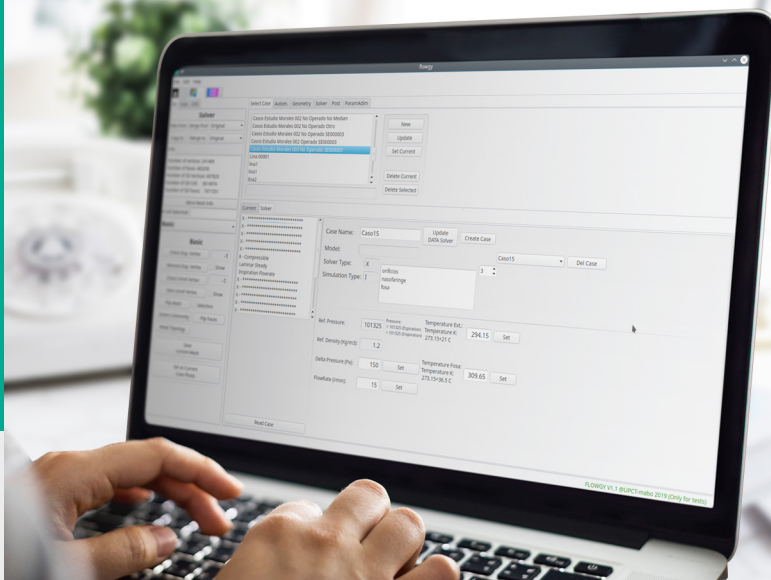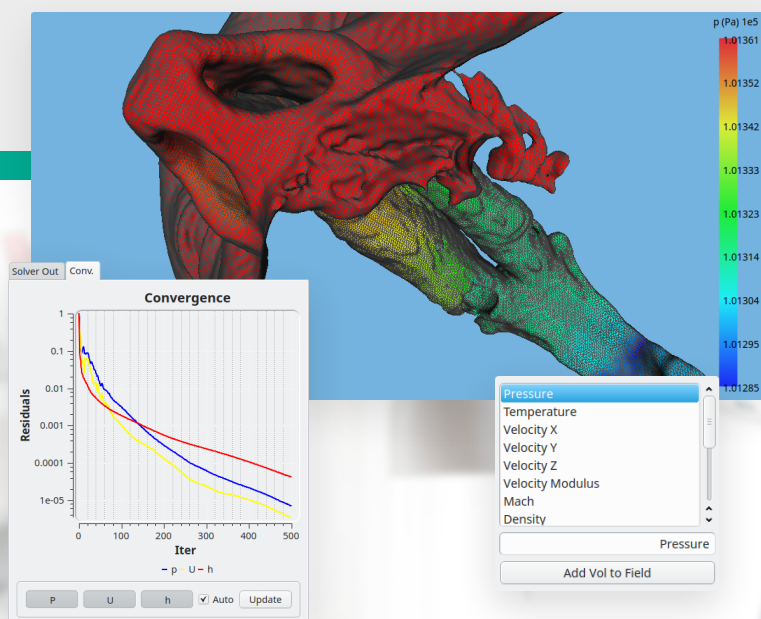
Report

Flowgy allows you to immediately produce personalized quantitative reports of all the parameters you consider relevant to the specific case. Detailed and visualized information in an easy and understandable way that will help you to diagnose and make decisions.

Main Features

+ Creation of the report in a few minutes.

+ Unlimited reports with selected parameters.

+ Report in PDF or digital to reproduce visually in the flowgy App (Flowgy Envision©) for computers, tablets and mobiles.

+ "Flowgy envision©" multiplatform (Windows, Android, IOs, Mac and Linux)

Non-Dimensional Estimators

Health Women   Health Mens   Disease Women   Disease Mens   CurrentH   CurrentD

| Data | Comments | Statistics |

RH:	11.6843	RD:	52.5657	XH	3.48205
SigRH:	5.0748	SigRD:	92.3347	YH	-0.239688
PhyH:	1.37604	PhyD:	1.57769	XD	0
SigPhyH:	0.28825	SigPhyD:	1.37419	YD	0

a: 1.39
P: 0.91183
PAH: 70

☑ Show Rectangle

Compute ST

Envision

visualize, study & collaborate

envision

flowgy

03
Flowgy envision©

Visualize, study and collaborate in a dynamic and interactive way the reports generated in Flowgy. No matter if it's your computer, tablet or mobile phone, Flowgy envision© helps you get the best diagnostic results.
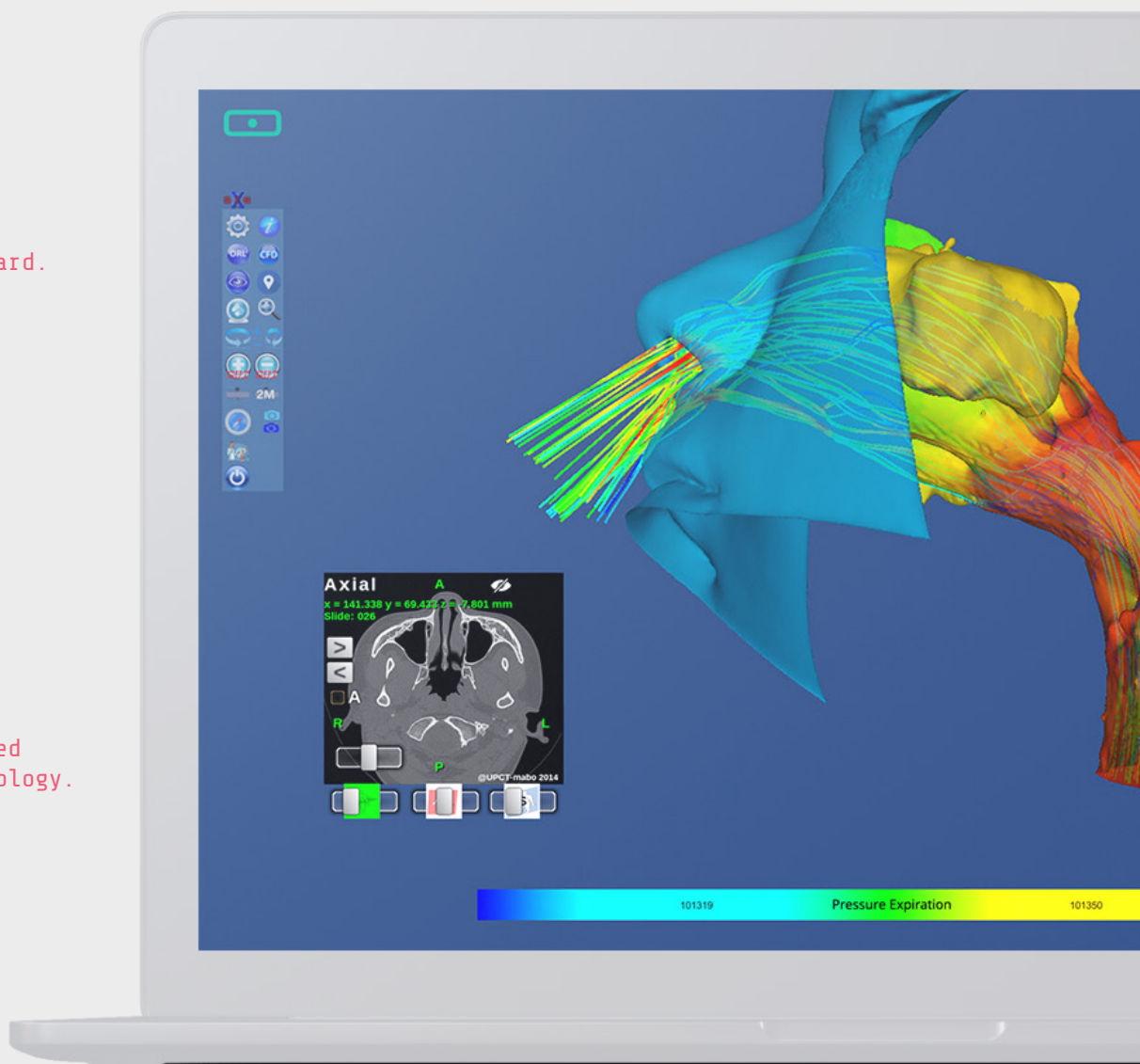
Connected space, where you can collaborate and keep moving forward.

Achieve the best results across any platform.

Every report is secured with the most sophisticated encryption technology.

research

flowgy

development

04

Flowgy R&D

Flowgy has been designed and developed to help the medical specialist achieve the best possible results in cases involving nasal obstruction, but also to encourage research, learning and professional growth.

Computational fluid mechanics techniques are now widely used in almost every field of research and development. Flowgy has been chosen as a research tool by various national and international hospitals for the study and optimization of processes related to nasal obstruction, the nasal cycle, septal perforations or to determine the relationship between otitis and nasal obstruction. In fields such as anthropology, Flowgy is being used to analyse the respiratory system of Neanderthals by reconstructing, from fossils, their nasal cavities and different organs of the respiratory system. The study of ictus probability, the analysis of other biological flows in different anatomical structures and the development of a robotic virtual surgery simulator are also examples of Flowgy's multidisciplinary nature thanks to the potential and high degree of flexibility of the modules it offers.

A world of new possibilities is about to come.

RELEVANT SCIENTIFIC PUBLICATIONS

2019

1 — 3D analysis of sexual dimorphism, allometry and variation in human airways.

Authors: Bastir M, Megía García I, Torres-Tamayo N, García Martínez D, Piqueras F, Burgos Olmos M. American Journal of Physical Anthropology. 2019. Accepted (forthcoming) doi: 10.1002 /ajpa.23944

2018

2 — A CFD approach to understand septal perforations.

Authors: Burgos M.A., Sanmiguel-Rojas, R. Rodríguez, F. Esteban-Ortega.
Eur Arch Otorhinolaryngol (2018)

3 — Nasal surgery handled by CFD tools.

Authors: E. Sanmiguel-Rojas, M.A. Burgos, F. Esteban- Ortega.
International Journal For Numerical Methods In Biomedical Engineering. 2018; e3126.

4 — DigBody®: A new 3D modeling tool for nasal virtual surgery.

Authors: M.A. Burgos, E. Sanmiguel-Rojas, Narinder Singh, F. Esteban-Ortega.
Computers in Biology and Medicine. Volume 98, 1 July 2018, Pages 118-125, ISSN 0010-4825.

5 — Virtual surgery for patients with nasal obstruction: Use of computational fluid dynamics (MeComLand®, Digbody® & Noseland®) to document objective flow parameters and optimise surgical results.

Authors: Burgos M.A., Sevilla-García MA, Sanmiguel-Rojas E, del Pino C, Fernández-Vélez C, Piqueras F & Esteban F. Acta Otorrinolaringológica Española. 2017 Sep 15.
pii: S0001-6519(17)30155-3. doi: 10.1016/j.otorri.2017.05.005.

6 — Robust non-dimensional estimators to assess the nasal airflow in health and disease.

Authors: Sanmiguel-Rojas, Enrique; Burgos M.A.; C. del Pino; M.A. Sevilla-García; F. Esteban-Ortega. International Journal For Numerical Methods In Biomedical Engineering. 2018;34: e2906.

2017

7 — New CFD tools to evaluate nasal airflow.

Authors: Burgos M.A., Sanmiguel-Rojas, C. del Pino, M.A. Sevilla-García, F. Esteban-Ortega.
Eur Arch Otorhinolaryngol (2017) 274: 3121.

2014

8 — Effects of the ambient temperature on the airflow across a Caucasian
nasal cavity.

Authors: Burgos, M.A., Sanmiguel-Rojas, E, Hidalgo-Martínez, M. y Martín-Alcántara, A.
International Journal For Numerical Methods In Biomedical Engineering, 30, (2014),
430-445. DOI: 10.1002/cnm.2616.

We are aiming to create a medical world in which technological innovation is available to all and serves the only purpose of improving people's quality of life

Universidad
Politécnica
de Cartagena