

BreastAnalyser

Problem

Breast cancer is the most diagnosed cancer worldwide and represents the fifth cause of cancer mortality globally. It is a highly heterogeneous disease that comprises various molecular subtypes, often diagnosed by 3,3'-diaminobenzidine tetrahydrochloride (DAB)-based immunohistochemistry (IHC), a procedure that stains specific protein antigens in brown. IHC is a widely employed technique in basic, translational and pathological anatomy research, where it can support the oncological diagnosis, therapeutic decisions and biomarker discovery. Nevertheless, its evaluation is often (semi)qualitative. The automatic analysis of microscopic pathology images is remarkably challenging due to the wide variability among patients, intimately related to the high complexity of breast cancer and to the inherent intricacy of pathological images because of differences in tissue processing, staining, image acquisition... Subsequently, there is a growing demand for more faithful and reliable methods for IHC quantitation, with computer-based image analysis resulting in higher precision, solidity and quality for this purpose.

Proposed Solution: BreastAnalyser

BreastAnalyser is a software with a friendly graphical interface that allows the quantification of human breast cancer immunohistochemical images. This software includes sophisticated segmentation algorithms to not only automatically measure the area of DAB-brown-stained proteins detected by IHC, but to also automatically count cell nuclei and classify them according to their DAB-brown-staining level. Furthermore, it allows post-supervision of all the performed quantitations by the end user, providing a clean, friendly and intuitive interface, which can also be used to annotate images or unify the experts' criteria. BreastAnalyser is fast enough to work online on a general-purpose personal computer in any biomedical laboratory.

Currently available software tools for this purpose often require certain programming or scripting skills, time-consuming fine-tuning of image pre-processing, extensive software training with sample images, lack or weak post-supervision of the automatic quantification or even specific and expensive scanning-microscopy devices. BreastAnalyser represents a more straightforward and reliable alternative, overcoming these limitations in terms of simplicity and pragmatism by providing an easy and fast way to review the automatic recognition of objects in the images.

BreastAnalyser software can competently support both basic and translational research. It might also be advantageous for certain tasks of pathological anatomy, namely automatization of IHC-brown signal quantitation, presenting a potential clinical tool for breast cancer diagnosis and prognosis.

Demostration video

[See the demonstration video](<https://gitlab.citius.usc.es/analyser/breastanalyser/-/raw/main/video/BreastAnalyserVideo.mp4>)

Collaborators

- CellCOM-INIBIC lab

Publications

- Marina Rodríguez-Candela Mateos, Maria Azmat, Paz Santiago-Freijanesa, Eva María Galán-Moya, Manuel Fernández-Delgado, Rosa Barbella Aponte, Joaquín Mosquera, Benigno Acea, Eva Cernadas, María Mayán. *BreastAnalyser: a software for the automatic analysis of breast cancer immunohistochemical images*, submitted, 2023.

Downloads

Please, cite the paper above if you use the software BreastAnalyser in your research.



- [Usage and installation instructions \(PDF\)](#)
- [Windows installer - setupBreastAnalyser.exe (available upon acceptance)]

- [Ubuntu 20.04 installer - breastanalyser_1.0_all.deb (available upon acceptance)]

INFORMACIÓN

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DESCARGAR

-  Repositorio Gitlab
-  Descargar de Gitlab