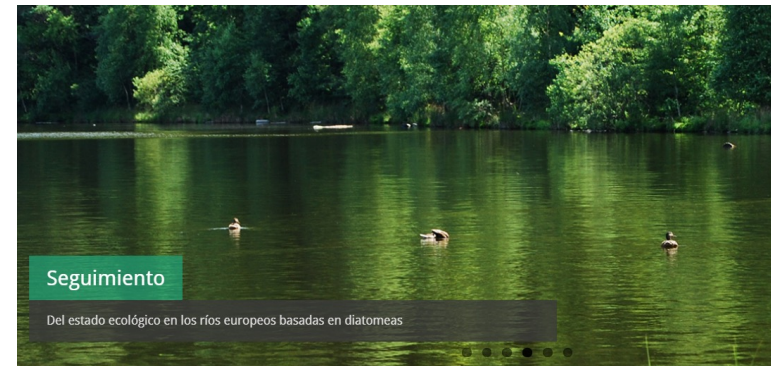
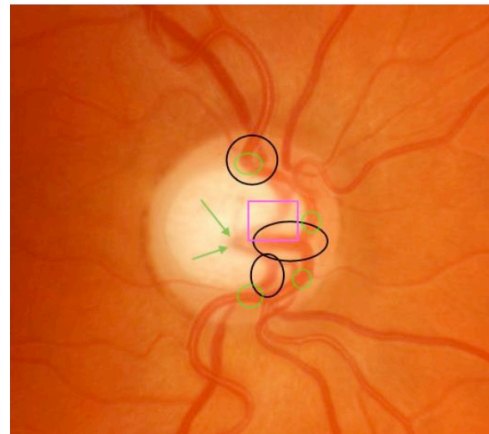
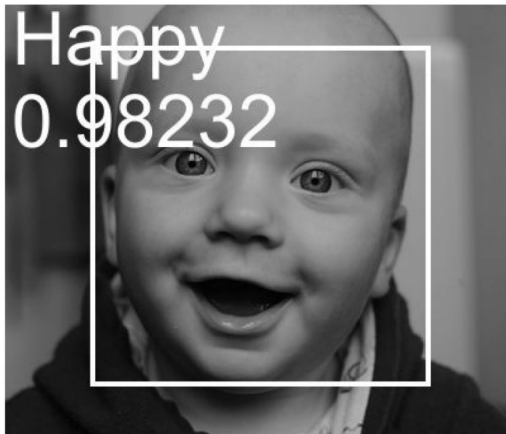
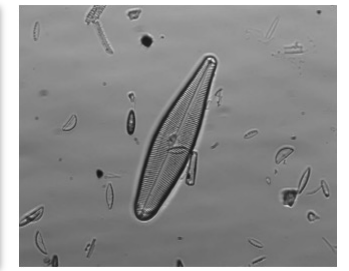
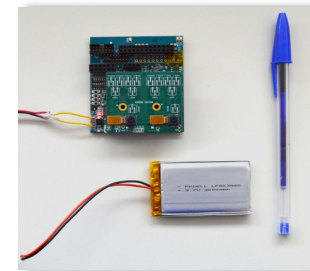
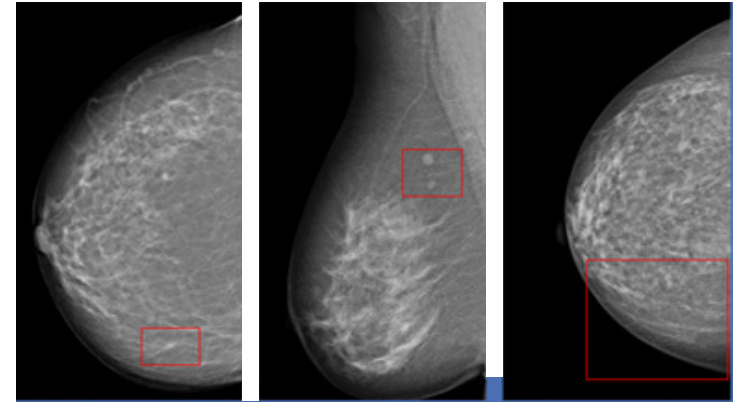




[Welcome VISILAB | Computer Vision and Artificial Intelligence research group \(uclm.es\)](http://uclm.es)

Higher Technical School of Industrial Engineering, UCLM in Ciudad Real (Spain)

- Computer Vision
- Artificial Intelligence



Applications

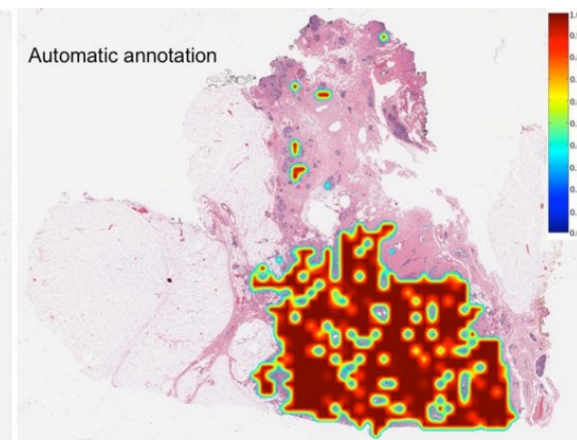
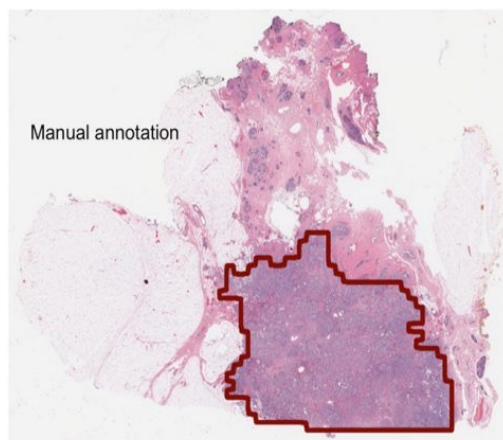
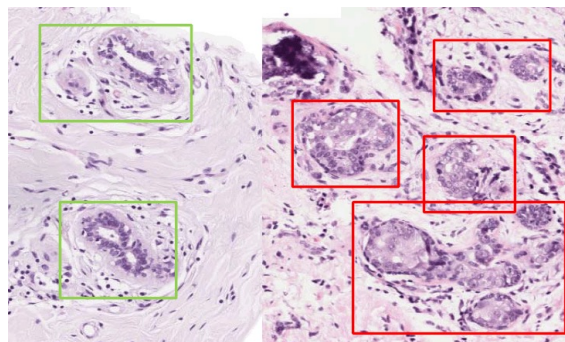
- Security: video surveillance, biometrics, weapons detection, human-robot interaction, etc. [DISARM - DISARM \(projectdisarm.com\)](http://projectdisarm.com)
- Space: AI on board.
- Medicine - Diagnostic imaging: digital pathology, radiology (CT, ECO, MRI, etc.), CADx decision support tools, etc.), CADx decision support tools.
- Biology and Environment: real-time monitoring of water quality, microscopic image analysis in biology (detection of diatoms, pollen, cyanobacteria, parasites, etc.).
- Psychology: Detection of moods by means of facial expressions (happiness, pain, anger, anger, etc.). (happiness, pain, anger, etc...) and automatic neuropsychological tests.

Relevant events

- European project coordinators: AIDPATH and Eyes of Things (EoT).
- European project nodes: ENVISION, MAESTRO, BONSEYES.
- Promotors of ESDIP (European Society of Digital and Integrative Pathology).
- Creators of the start-up UBOTICA.



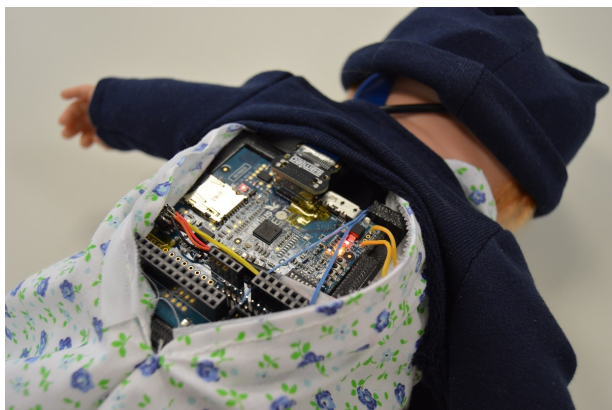
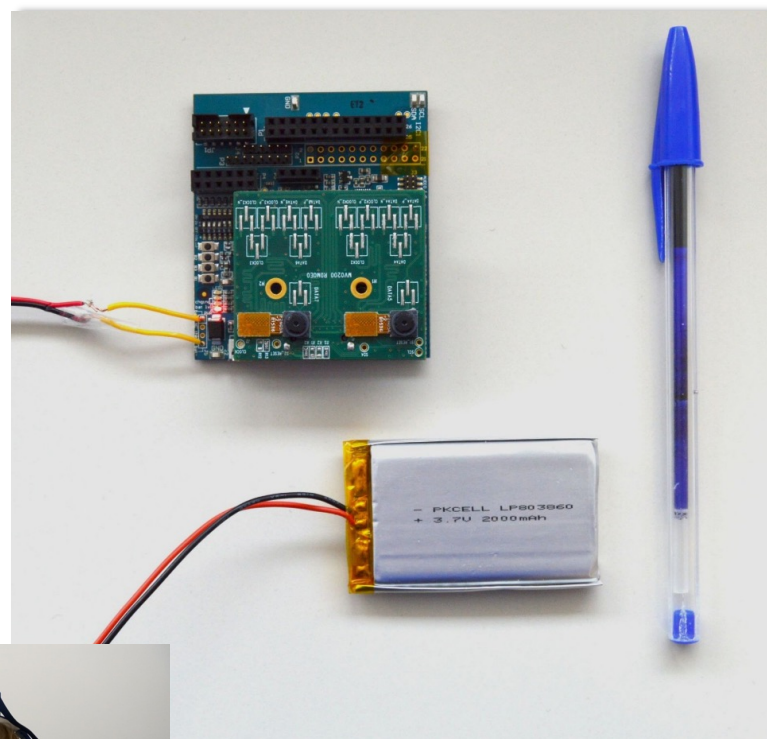
FP7, 11 partners
Coordinated by VISILAB





H2020, 8 partners
Coordinated by VISILAB

Embedded vision and Deep Learning

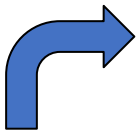




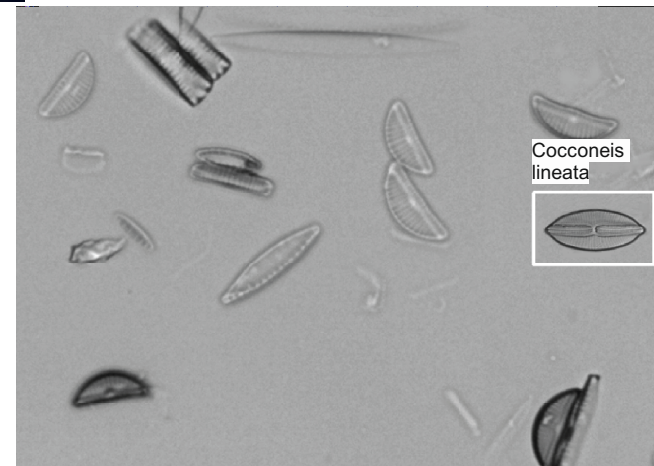
AQUALITAS
IDENTIFICACIÓN Y CLASIFICACIÓN
AUTOMÁTICA DE DIATOMEAS

Automatic Identification

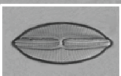
100 different diatom species

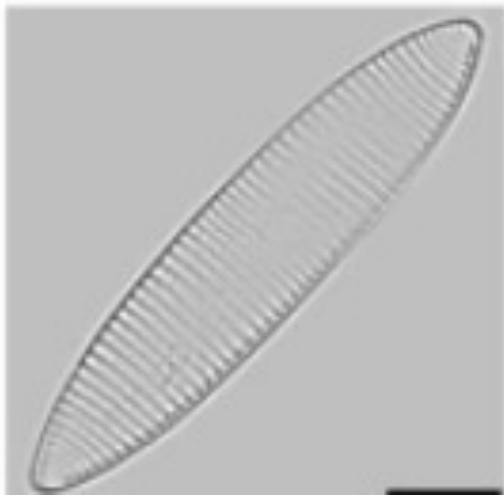
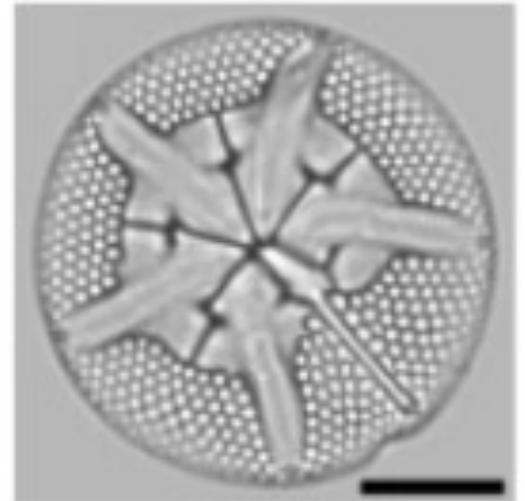
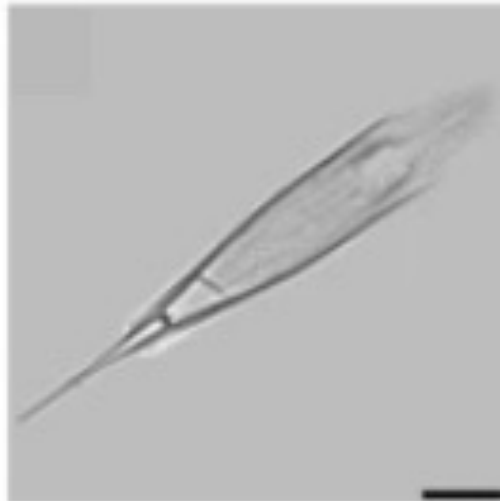
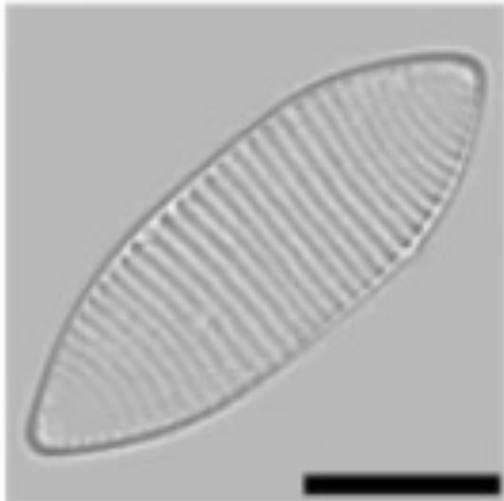


Diatom-based monitoring of the ecological status of European rivers



Cocconeis
lineata












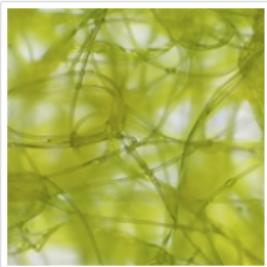
Article

A Low-Cost Automated Digital Microscopy Platform for Automatic Identification of Diatoms

Jesús Salido ^{1,*}, Carlos Sánchez ², Jesús Ruiz-Santaquiteria ¹, Gabriel Cristóbal ², Saul Blanco ³ and Gloria Bueno ¹

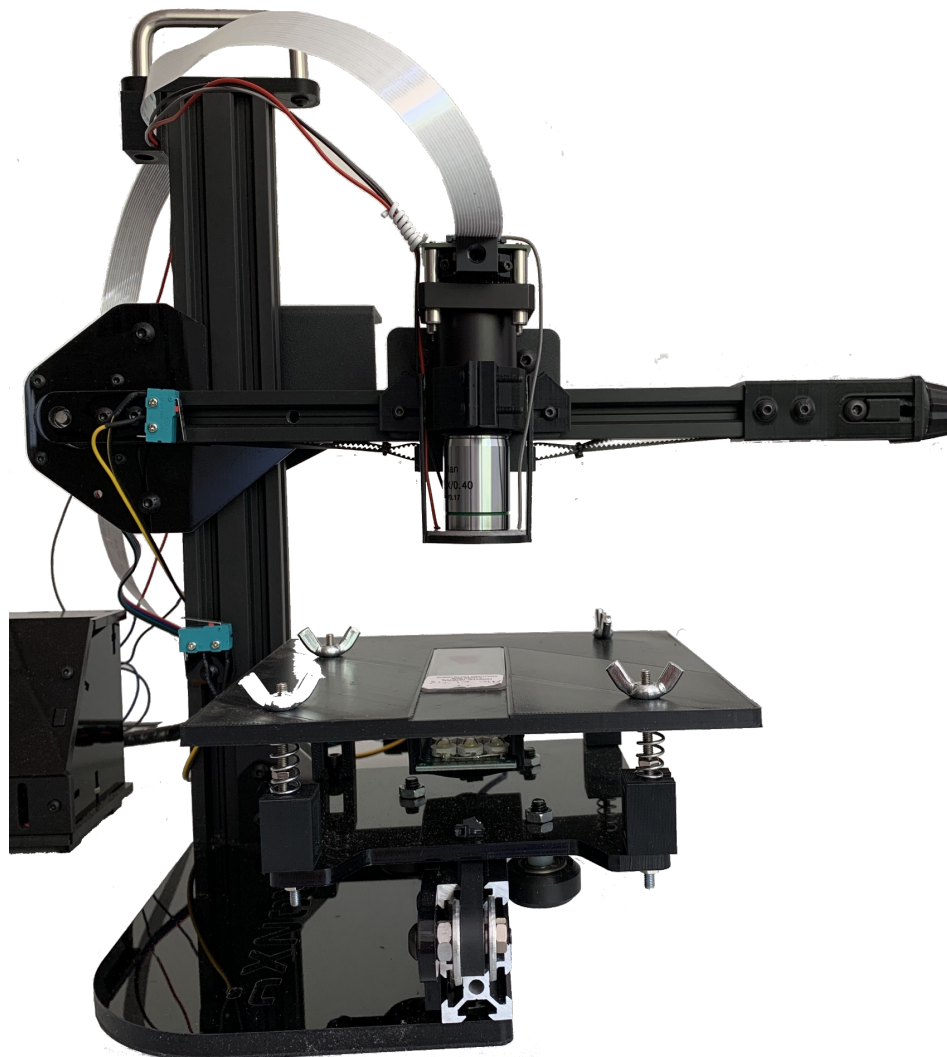
Received: 28 July 2020; Accepted: 25 August 2020; Published: 31 August 2020

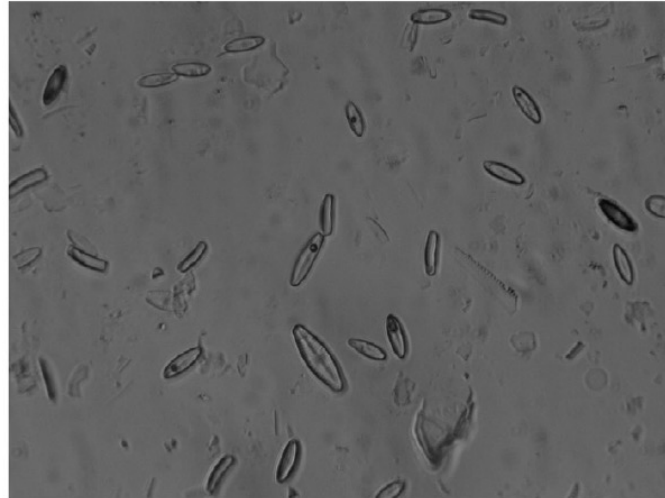
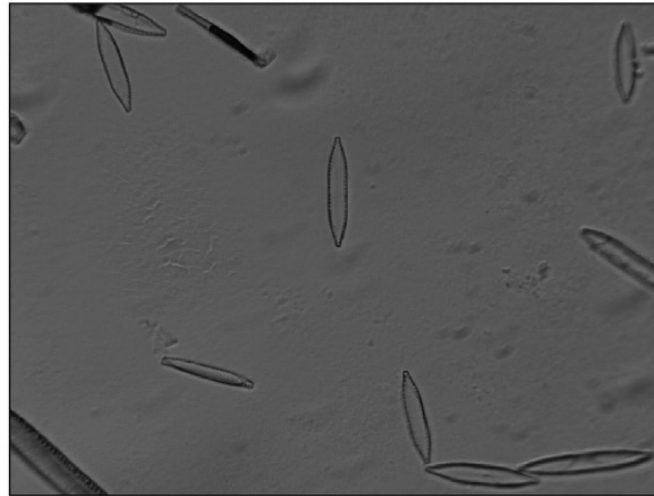
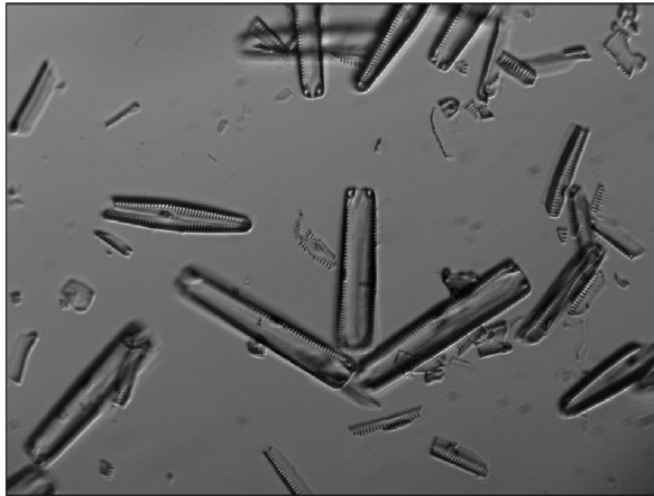
Biomedical Optics Express Vol. 12, Issue 11, pp. 7223-7243 (2021) • <https://doi.org/10.1364/BOE.439014>



MicroHikari3D: an automated DIY digital microscopy platform with deep learning capabilities

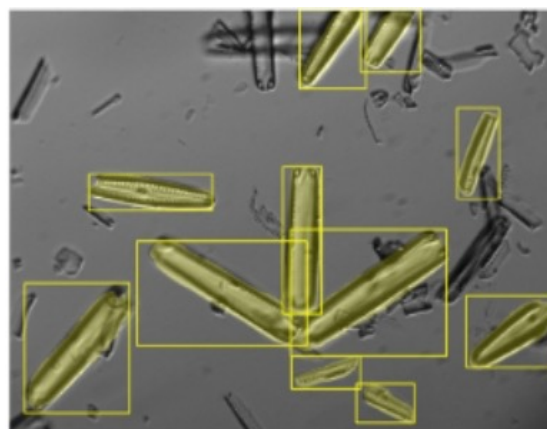
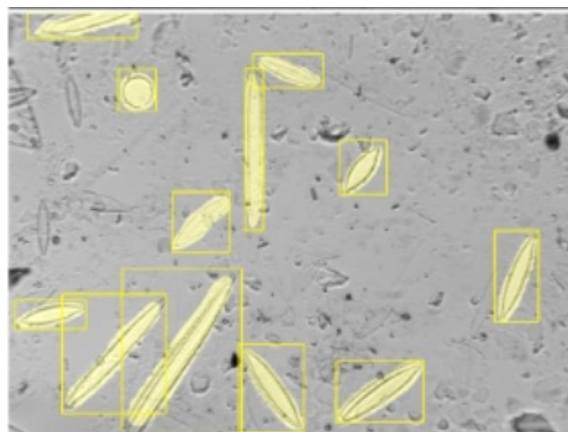
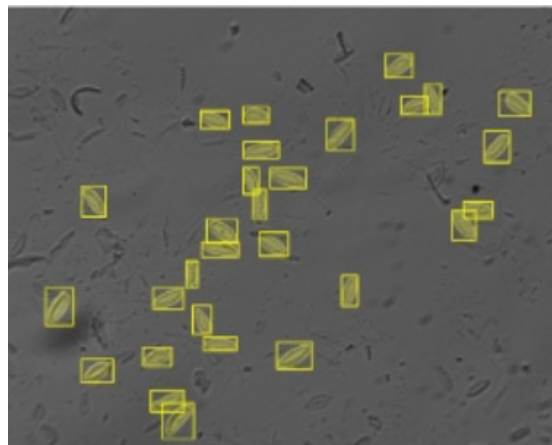
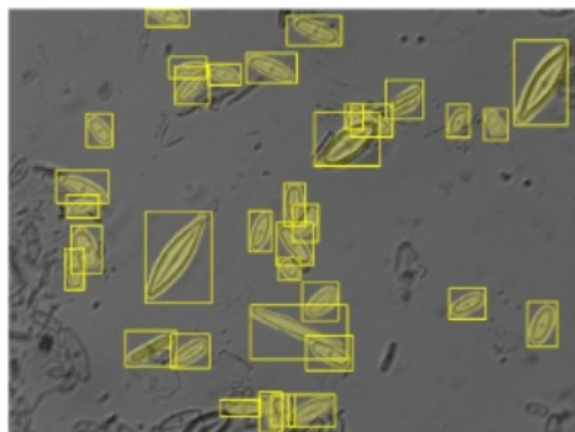
J. Salido, P. T. Toledano, N. Vallez, O. Deniz, J. Ruiz-Santaquiteria, G. Cristobal, and G. Bueno







Diatom Detection

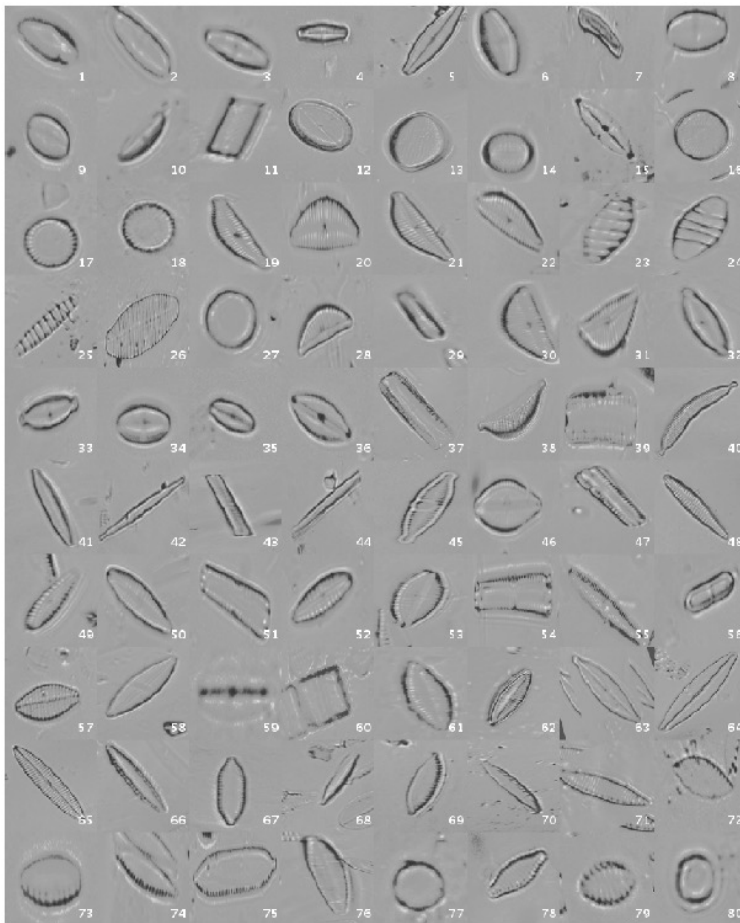


Semantic and
Instance Segmentation

Mask-RCNN - 92%

*Semantic versus instance segmentation in
microscopic algae detection*
J Ruiz-Santaquiteria, G Bueno, O Deniz, N
Vallez, G Cristobal
Engineering Applications of Artificial
Intelligence 87, 103271, 2020
<https://doi.org/10.1016/j.engappai.2019.103271>

Diatom Classification



Automated Diatom Classification (Part A): Handcrafted feature approaches

G Bueno, O Deniz, A Pedraza, J Ruiz-Santaquiteria, J Salido, G Cristóbal, et al.

Applied Sciences 7 (8), 753, 2017

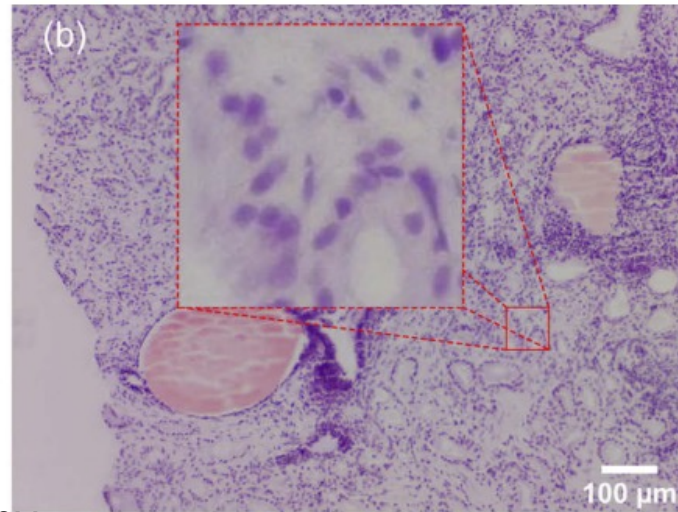
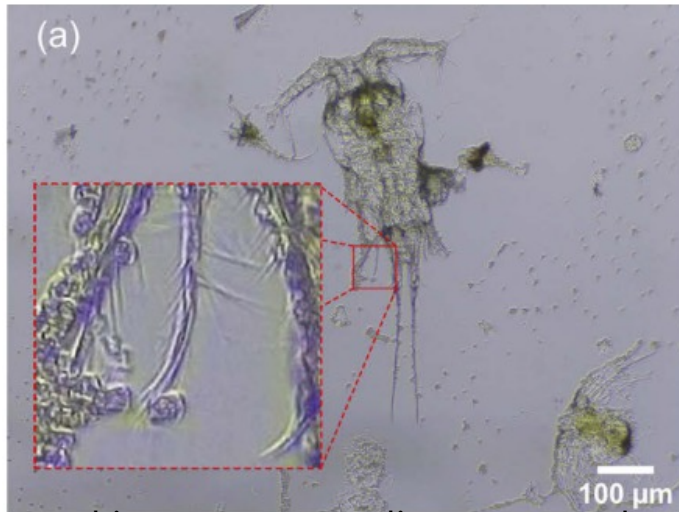
<https://doi.org/10.3390/app7080753>

Automated Diatom Classification (Part B): A Deep Learning Approach

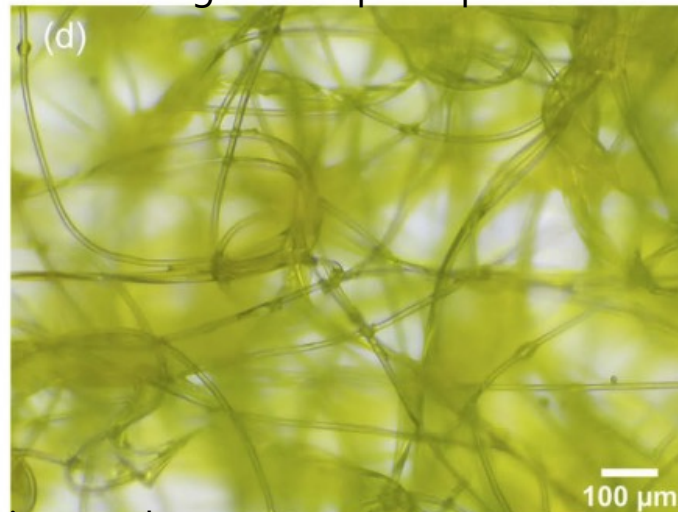
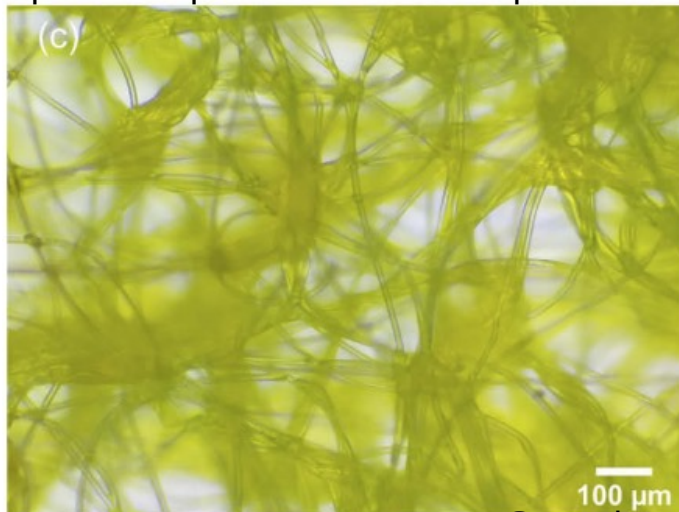
A Pedraza, G Bueno, O Deniz, G Cristóbal, S Blanco, M Borrego-Ramos

Applied Sciences 7 (5), 460, 2017

<https://doi.org/10.3390/app7050460>



Copepod in aqueous medium captured at 10X Pathological sample captured at 20x



Cyanobacteria samples

E.C. FP7 APIFRESH

APIFRESH: E.C. FP7, Developing European standards for bee pollen and royal jelly: quality, safety and authenticity.



Three Main objectives :

1. To develop European standards for bee pollen and royal jelly.
2. Establishment of the health relevant criteria for pollen and royal jelly.
3. The development of an accurate methodology for the determination of pollen and honey origin authenticity Claims made by several European Associations of beekeepers about the lack of quality controls in both marketed pollen and royal jelly for human consumption give rise to the developing of such standards.

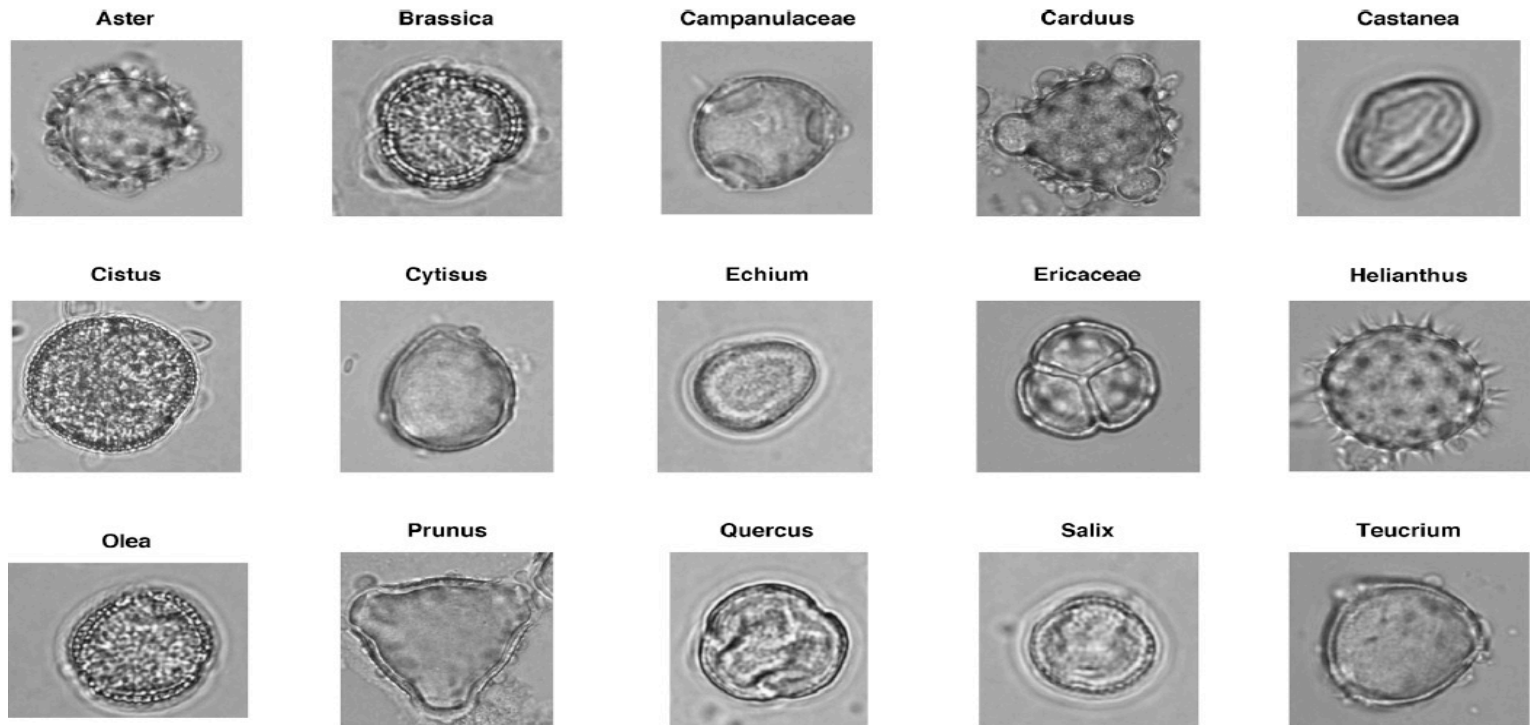
APIFRESH

VISILAB was subcontracted for this project.

Our team was provided with pollen microscopy images and had to detect the grains and classify them.

**Automatic
Identification**

15 different
species



- [Academia and Industry Collaboration for Digital Pathology | AIDPATH Project | Fact Sheet | FP7 | CORDIS | European Commission \(europa.eu\)](#)
- [Eyes of Things | EoT Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)
- [Developing European standards for bee pollen and royal jelly: quality, safety and authenticity | APIFRESH Project | Fact Sheet | FP7 | CORDIS | European Commission \(europa.eu\)](#)
- [Welcome VISILAB | Computer Vision and Artificial Intelligence research group \(uclm.es\)](#)
- Contact details: barbara.caballero@uclm.es