

# smartdots

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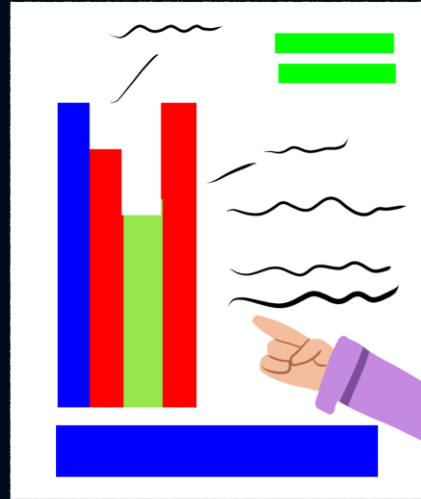
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# Start of project SmartDots platform

Start of SmartDots as a platform to facilitate events was a meeting between ICES, ILVO, DTU, IRM.



SmartDots software was initially a software developed by ILVO to mark dots in Otoliths images.



# SmartDots as a platform

SmartDots is a platform for **quality assurance** of **biological parameters** as input for **stock assessment** (Julie Davies - 2018)

Events on biological parameters (e.g age and maturity) allow users across countries to share knowledge and experience.



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# SmartDots

a) Do you know what are otoliths?

b) Why do we need an app to mark dots in an image?

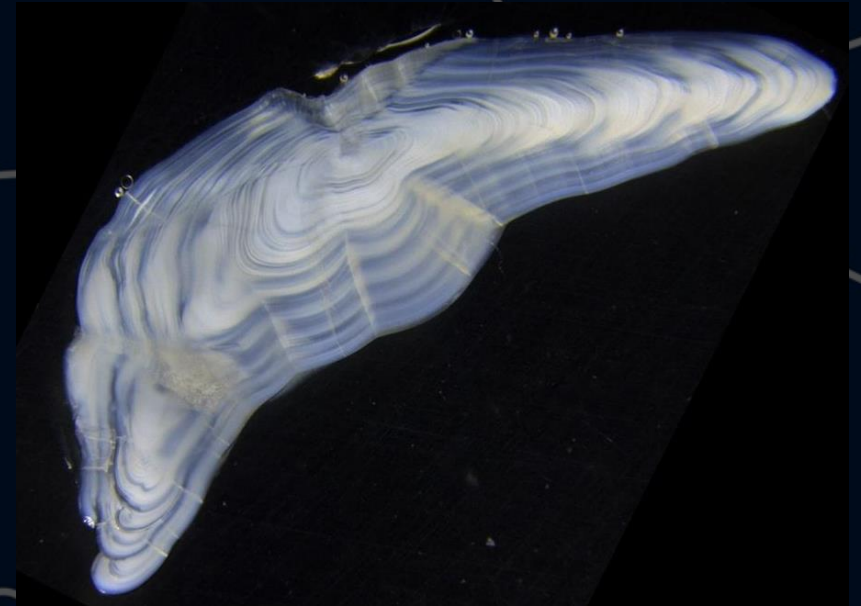


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# SmartDots – What are otoliths?

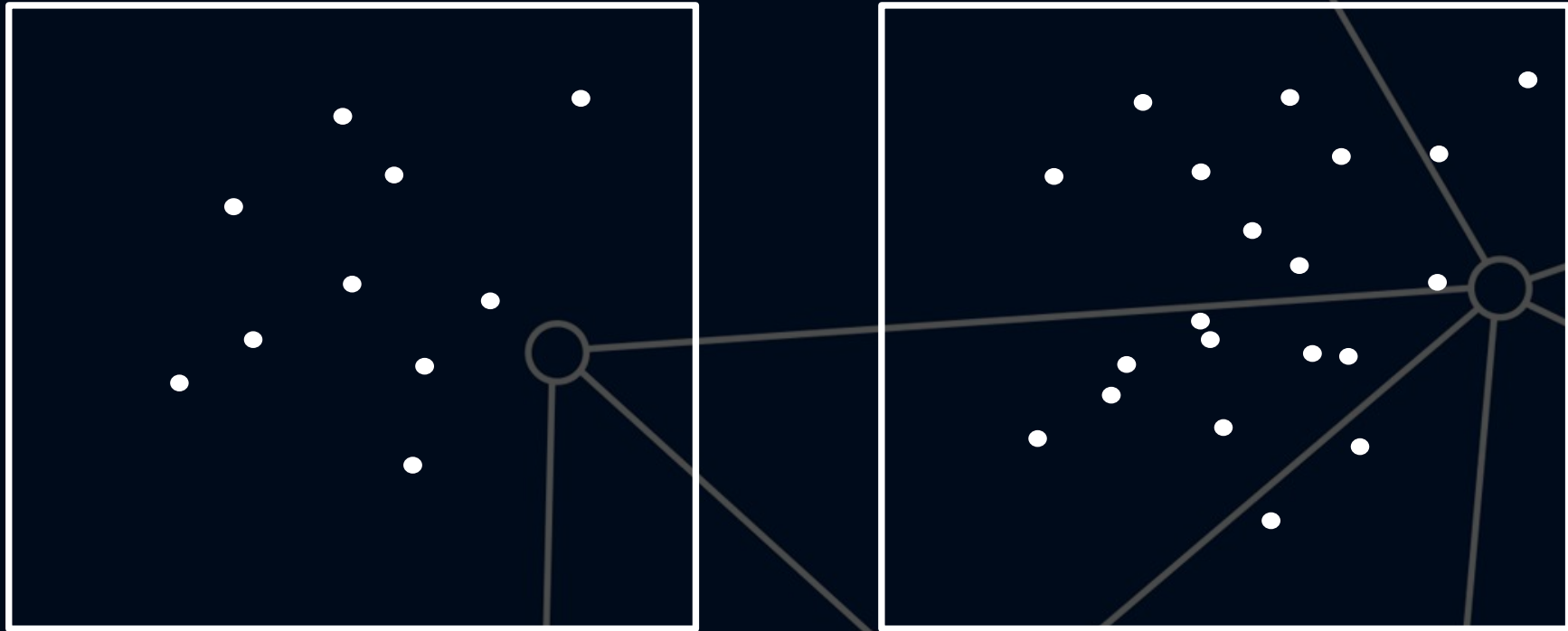
Otolith is a calcium carbonate structure in the inner ear that can reveal growth rate and age of a fish



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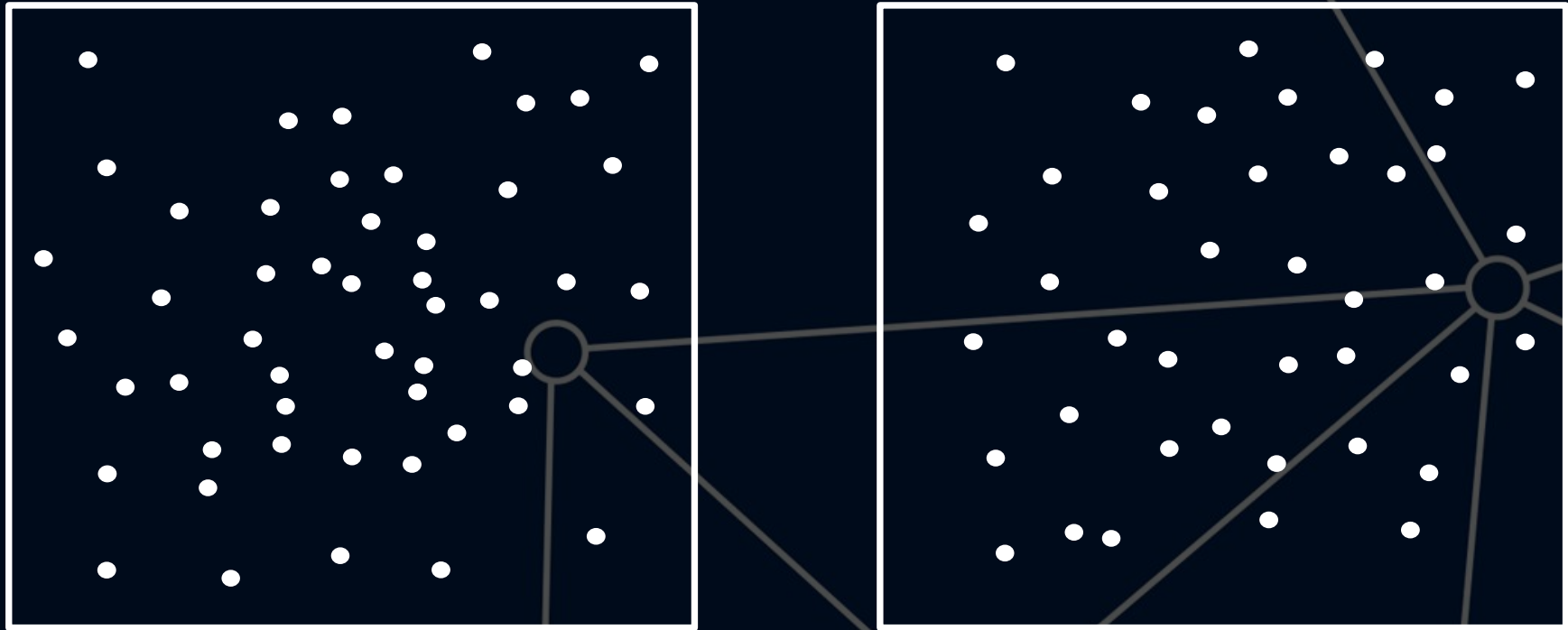
# SmartDots – Why do we need an app to mark dots?



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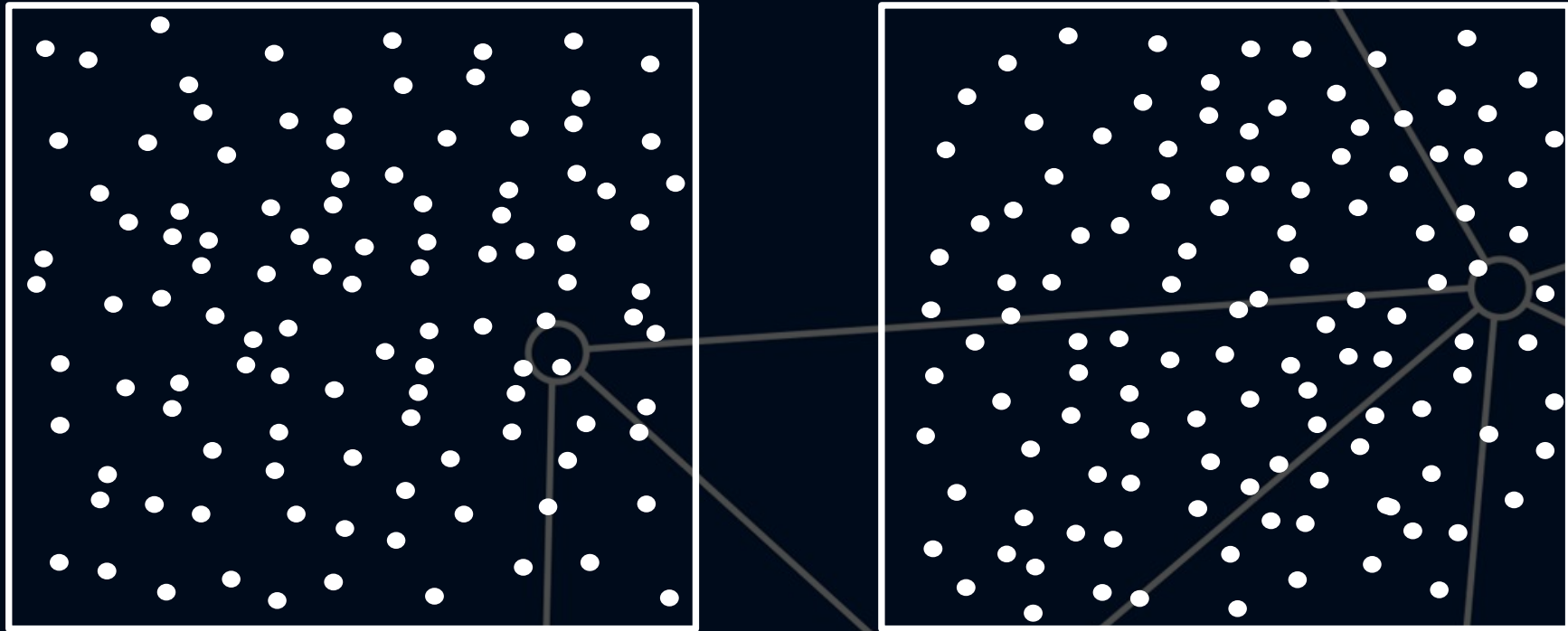
# SmartDots – Why do we need an app to mark dots?



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# SmartDots – Why do we need an app to mark dots?

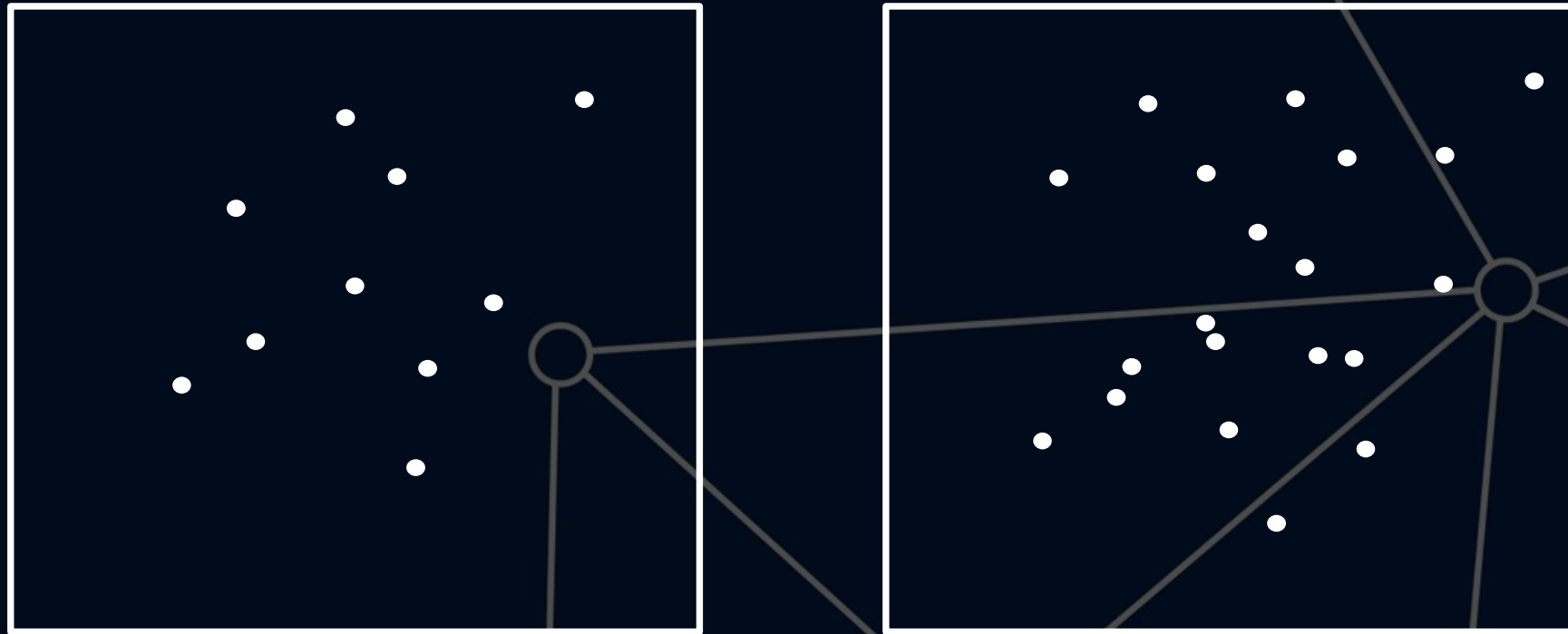


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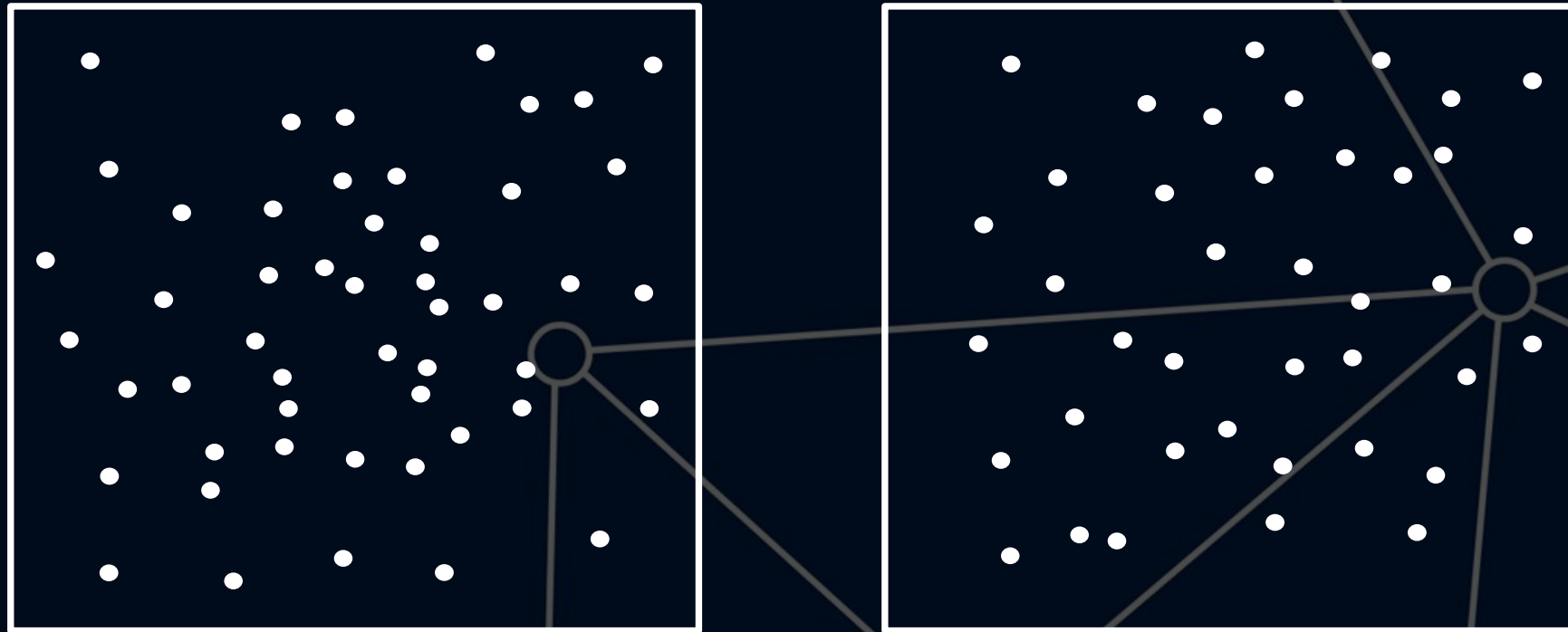


# SmartDots – Why do we need an app to mark dots?



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# SmartDots – Why do we need an app to mark dots?



50

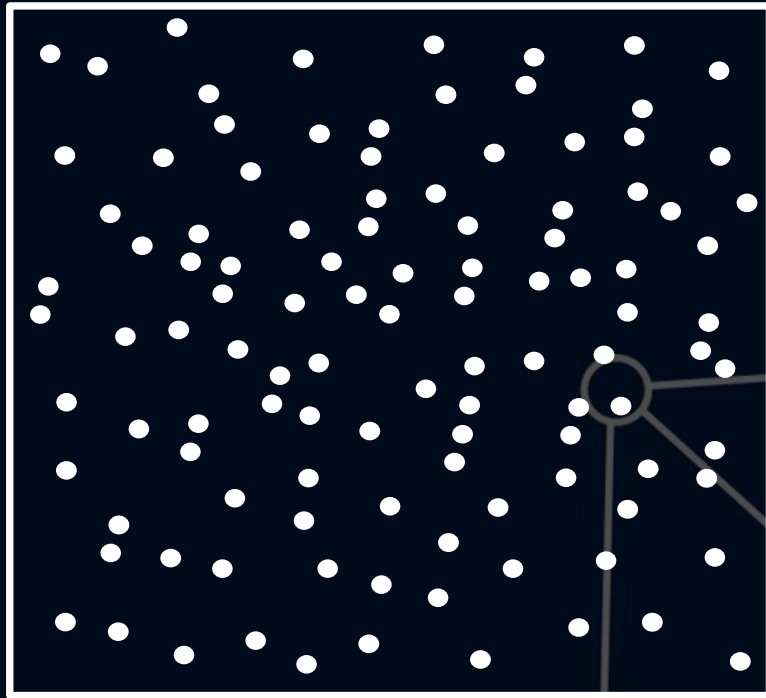
40



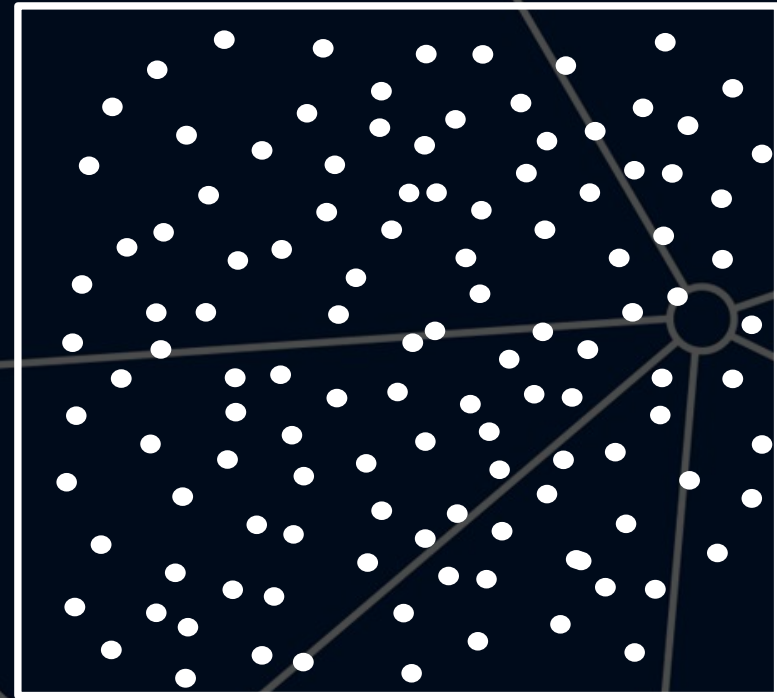
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# SmartDots – Why do we need an app to mark dots?



110



120



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# Weber–Fechner law

Laws relate to human perception, more specifically the relation between the actual change in a physical stimulus and the perceived change



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Weber

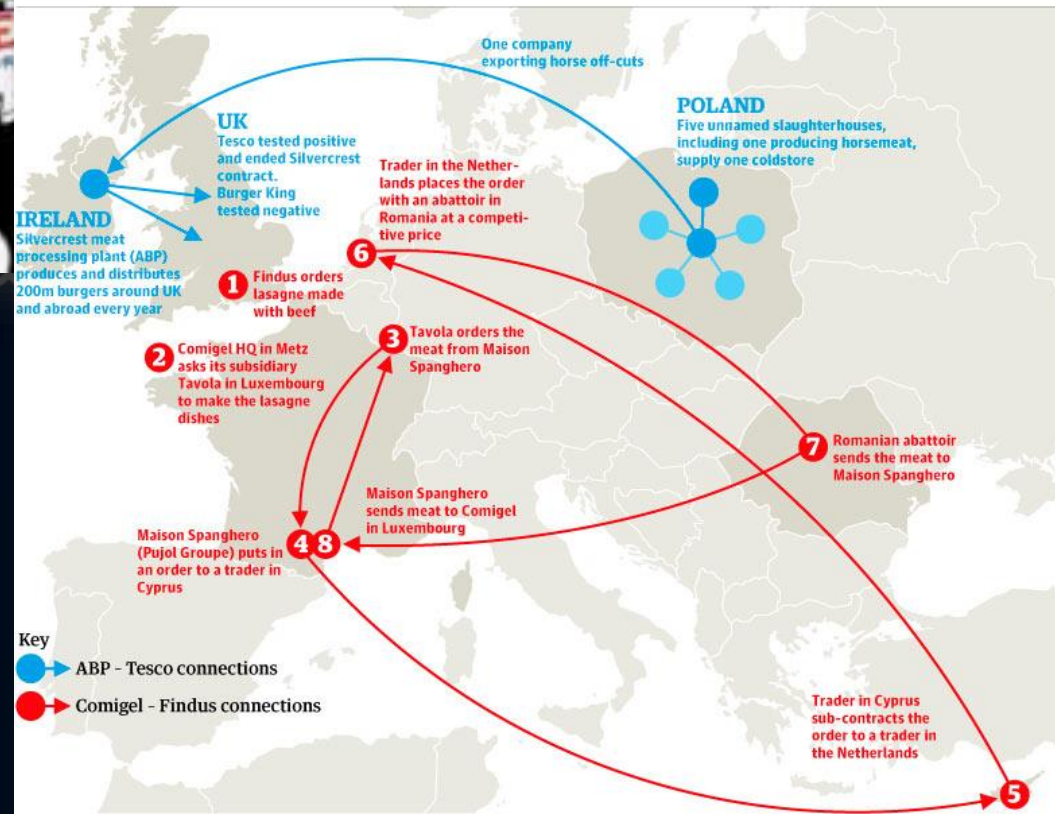


Fechner

# - How to avoid horsemeat



Britain's horsemeat The ABP and Comigel connections



# ICES – Stock assessment advice

ICES gives advice to the clients this advice should be **transparent** and **reproducible**

What information is needed to do an informed advice  
e.g. Ages and maturity of the fish



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# SmartDots components - WebInterface

## Main objective

Link all the modules together

- Serves as a tool for national coordinators to:
  - Manage age readers expertise
  - Add age readers to the events
  - Set up new events (Exchange, Workshop, training or a demo)
  - Follow the progress of an event

## Main public feature

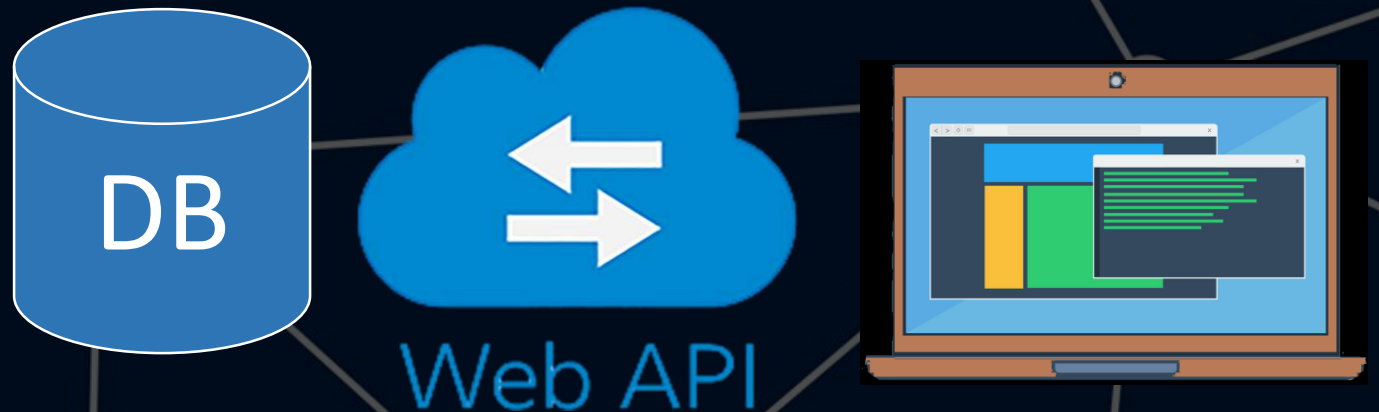
- View published events
- **Developed by ICES**

# SmartDots components - WebAPI

## Main objective

- Bridges the communication between the software and the database.

- Developed by ILVO/ICES
- Open source
- Developed in C#
- Implements the rules



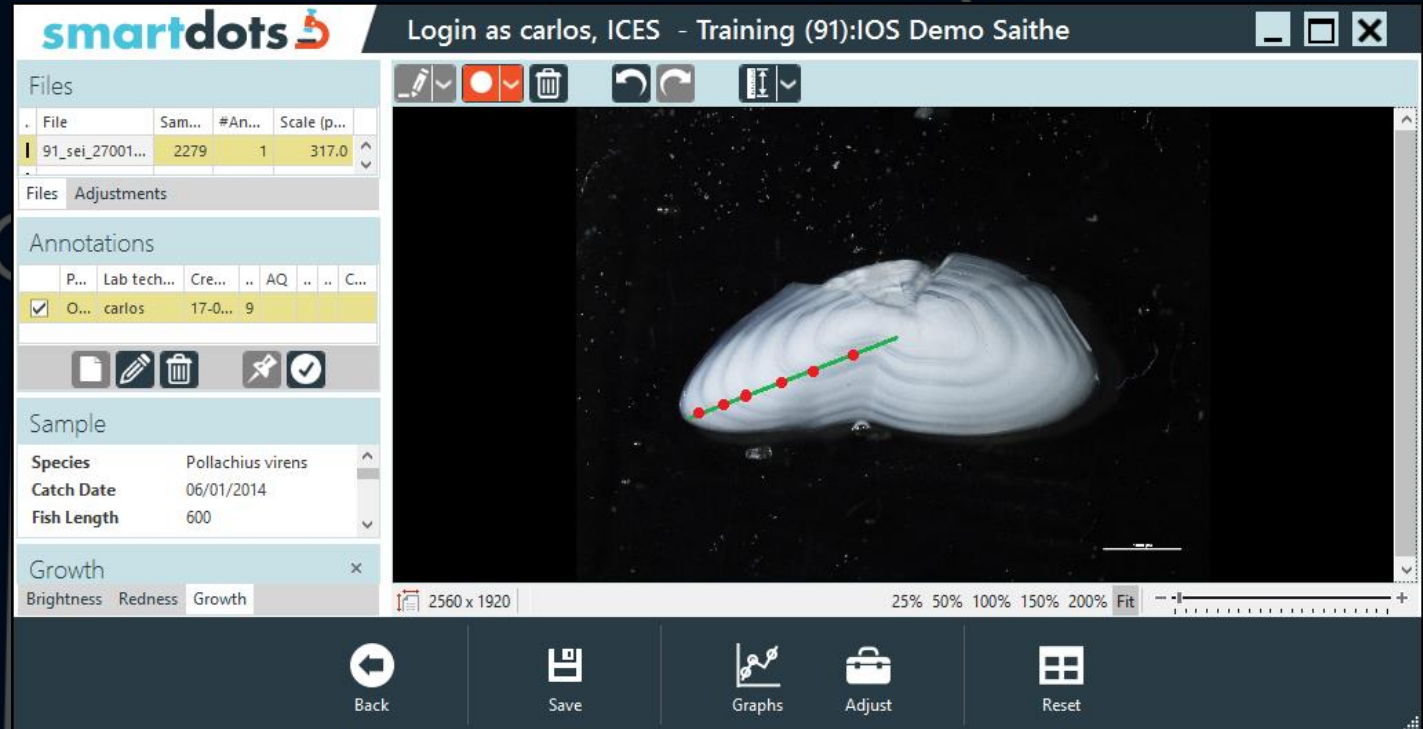


# SmartDots components - Software

## Main objective

- Allows age readers to annotate an image without seeing the annotation of other readers.

- Developed by ILVO
- Open source (GPL v3.0)
- Microsoft WPF application
- Developed in C#
- Has a portable version



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# SmartDots components – Reporting script

## Main objective

- Generate a report with tables and figures for the stock assessor.

- Developed by DTU
- Mantained by ICES
- Open source (GitHub)
- R script



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centre of the stock which is then being counted as 6 annuli and this could explain the overlap between the annotations at annulus 2 and 3 and the annotation at annulus 4 for R

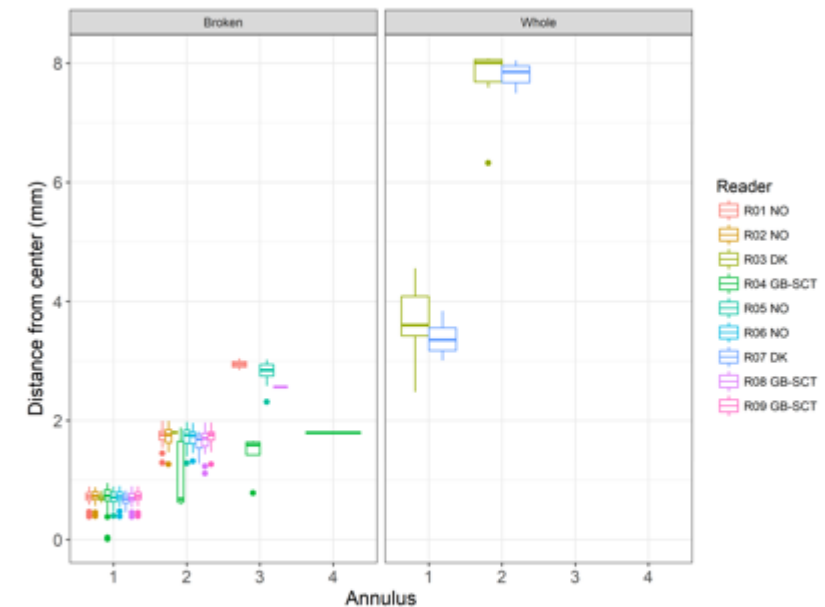


Figure 3.2.2: Plot of average distance from the centre to the annuli (where annotations are on the winter ring) for all readers and for each preparation separately. The boxes represent the median boundaries of the interquartile range, whiskers represent the minimum and maximum values and outliers.

# SmartDots - future

We are looking for the platform to accommodate:

- Otholits Shape analysis
- Zooplankton images
- Eggs and Larvae images

Supporting machine learning technics for helping events is an idea

- First event on maturity reading is coming in January
- Maturity reporting is still in development
- Governance group has been established



# SmartDots – Any questions?

Try it yourself

Get a guest token here:

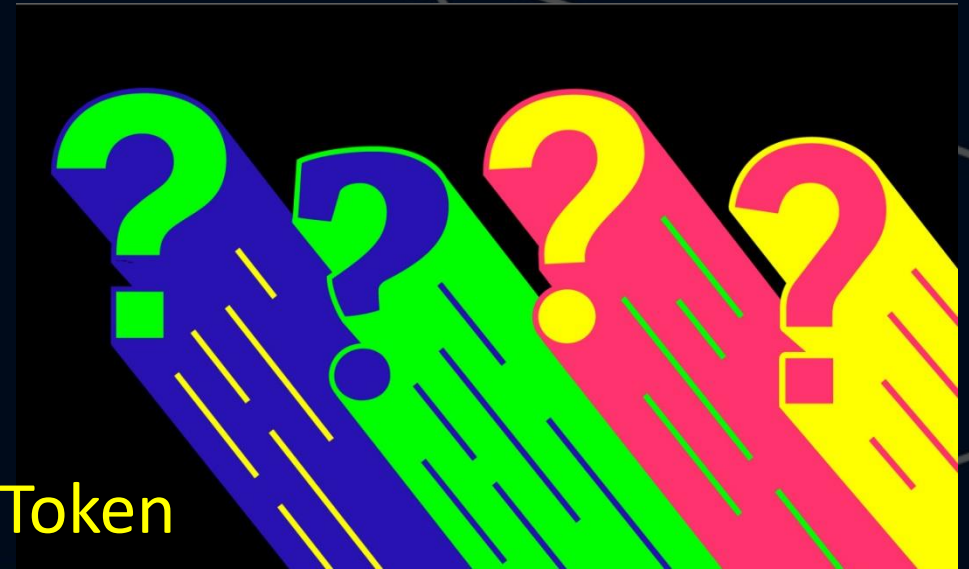
<http://smartdots.ices.dk/webapi/GetGuestToken>

Download the software here:

<https://github.com/ices-eg/SmartDots/blob/master/README.md#getting-started>

View list events:

<http://smartdots.ices.dk/viewlistevents>



# Has anyone ever seen a bobsleigh competition?



# Let's see the start of the Bobsleigh heat

- Bobsled or bobsleigh is a sport played during the Winter Olympic Games. It is played by riding on iced tracks with a sled
- The crew has a pilot, a brakeman, and pushers. Athletes are selected based on their speed and strength, which are necessary to push the sleigh to a competitive speed at the start of the race.
- Pilots must have the skill, timing, and finesse to steer the sleigh along the path.



# Bobsleigh - Winter Olympic Sport

