

DATA-DRIVEN ANIMATION
INTERACTIVE 3D MODELS
SOCIAL MEDIA IN FOREST RESEARCH



math.tut.fi/inversegroup

Markku Åkerblom
Sanna Kaasalainen
Pasi Raumonen
Mikko Kaasalainen

ANIMATION

MODELS

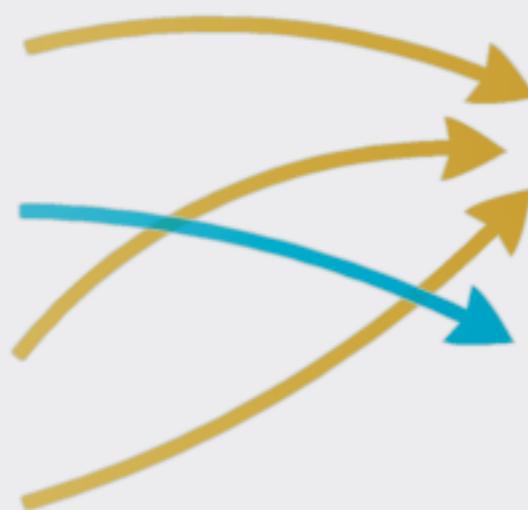
FOREST RESEARCH

Markku Åkerblom

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Tampere University of Technology

Finnish Geospatial Research Institute

National Land Survey

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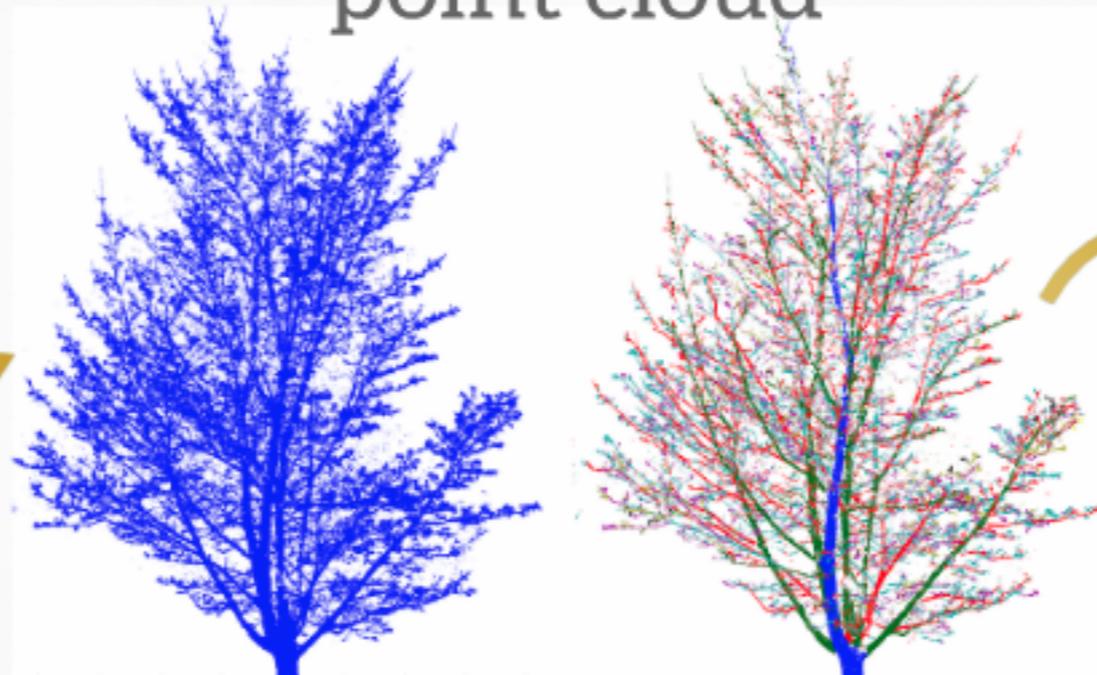
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BACKGROUND

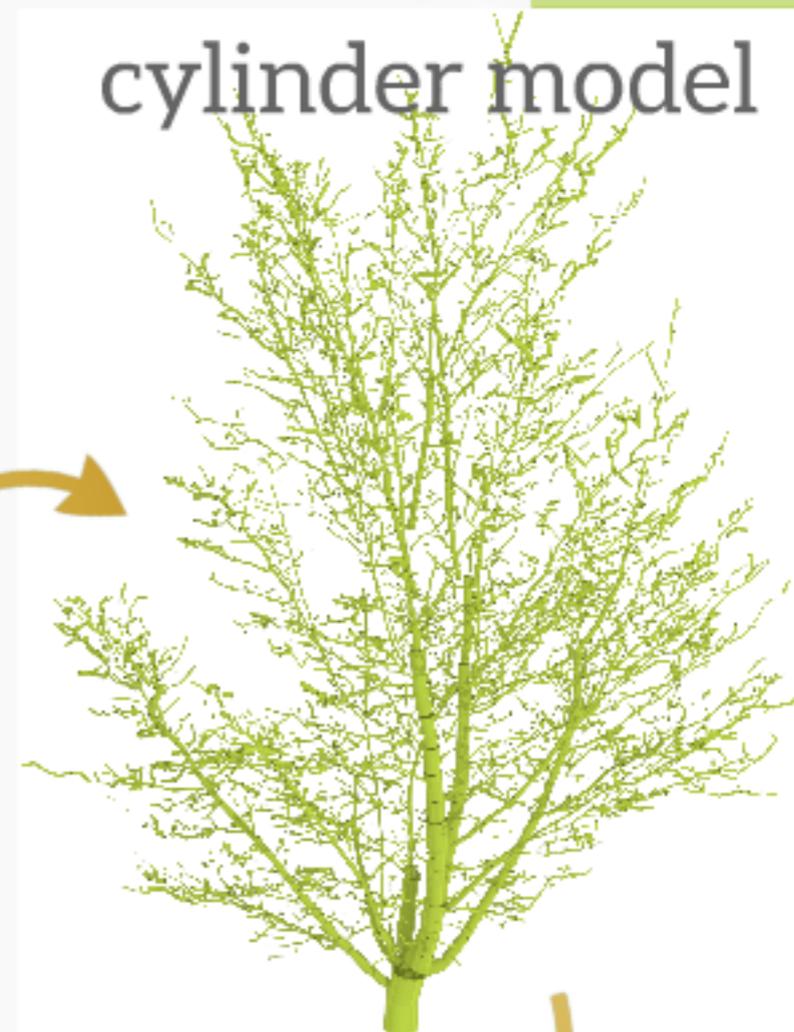
TLS



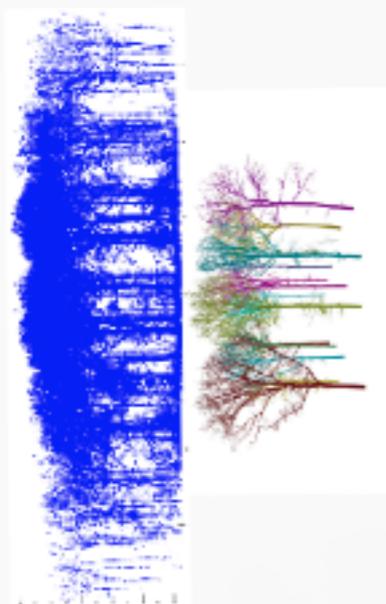
point cloud



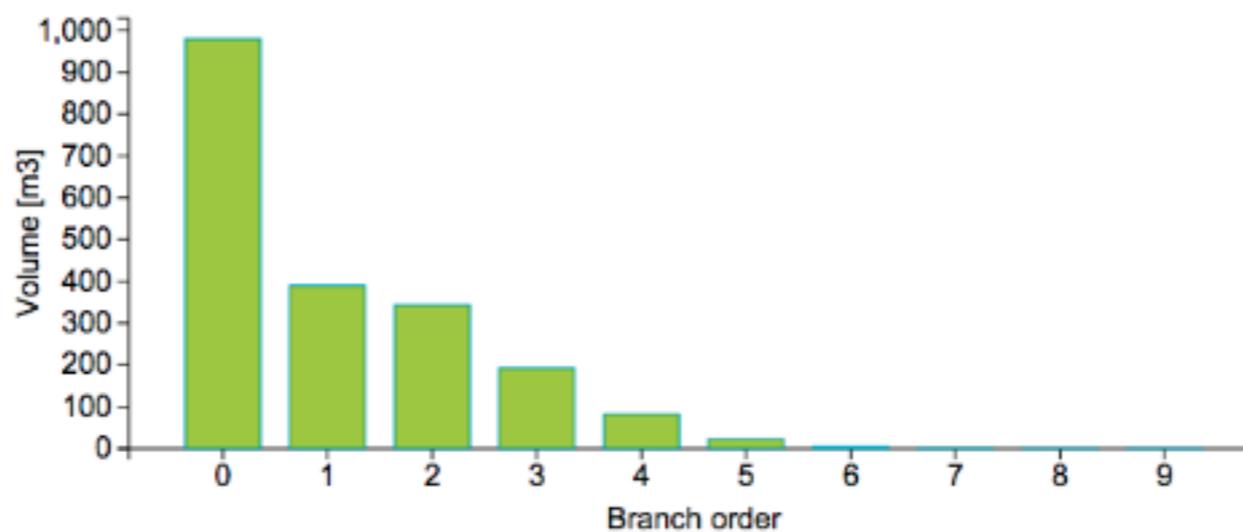
cylinder model



Plot level reconstruction



Branch size distribution



Branch

Element

Length

Volume

Area

Absolute

Relative

statistics

Plot level reconstruction



DATA-DRIVEN ANIMATIONS



Basic properties

Cylinders	4625
Branches	1009
Volume	2.72 m ³
Surface area	105.9 m ²

Stem taper



Size distribution



Planning

- Compute results
- Select parts that benefit from visualization
 - Complex results
 - Examples that don't fit a publication
 - Summary of lengthy content
 - Know your audience
- Export data



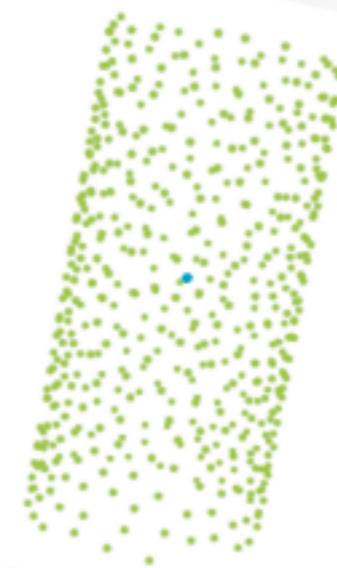
The final cylinder model

Creation

- Use the right tools
 - www.blender.org 
 - Steep learning curve but worth it
- Keep videos short and simple
 - Balance between accuracy/understandability
 - Use voice-over or text

Publishing

- Group homepage
 - Ties to scientific framework
 - Enables linking of datasets
-  
 - Provides file hosting and video settings
 - Commenting system
 - Search functionality

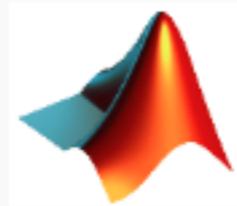


Compute means of top and bottom leaves.

- point on the axis
- axis direction
- radius

Planning

- Compute results
- Select parts that benefit from visualization
 - Complex results
 - Examples that don't fit a publication
 - Summary of lengthy content
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MATLAB
The Language of Technical Computing

Creation

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Publishing

- Group homepage
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You 

bit.ly/1FU9tRI

- Provides file hosting and video settings
- Commenting system
- Search functionality



3D Forest Information



TUT Inverse Problems

 **Subscribe** 13

649 views



Published on Nov 9, 2014

This video shows how a forest plot can be automatically reconstructed from terrestrial laser scanning (TLS) data. Each of the trees are identified in the data and reconstructed as cylinder models.

SHOW MORE

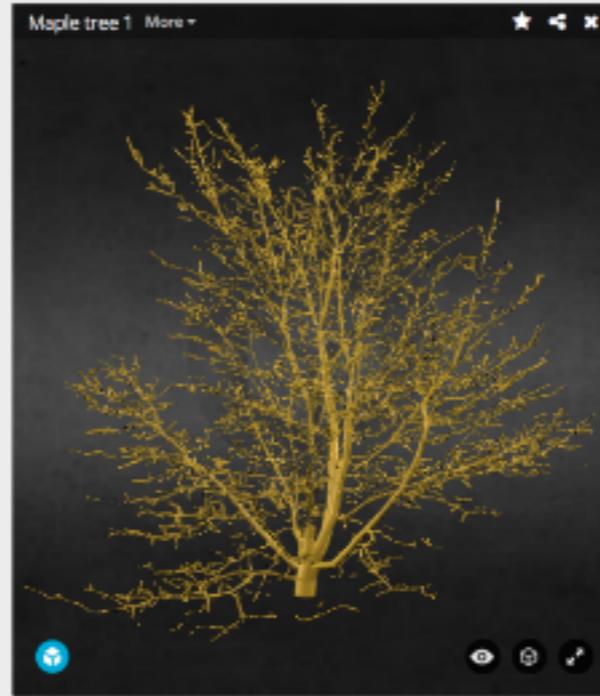
ALL COMMENTS (1)



John Armston Shared on Google+ · 6 months ago
smooth...

Reply · 2  

INTERACTIVE 3D MODELS



Creating

- Compute results
- Export data (.obj file)
 - Vertex and face information
 - Select color / texture

Publishing

- 3rd party service for storing and displaying models
- sketchfab.com
 - store & embed
 - no plugins required



Automation

- When models are reconstructed
 - Export to file
 - Compute properties
 - Upload model
 - Embed new model to gallery
- Updating is very simple

Augmenting



ELS



Augmenting

Creating

- Compute results
- Export data (.obj file)
 - Vertex and face information
 - Select color / texture

Publishing

- 3rd party service for storing and displaying models
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Automation

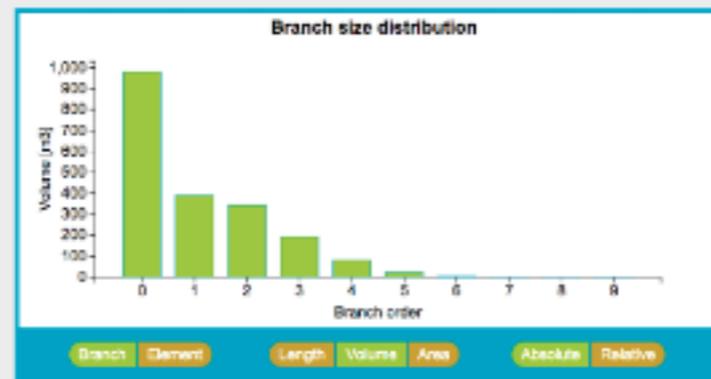
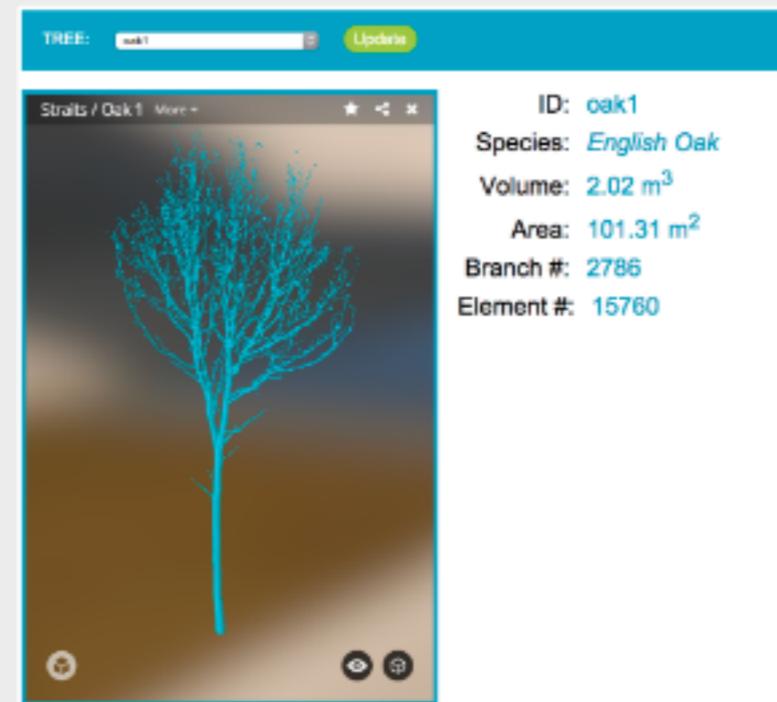
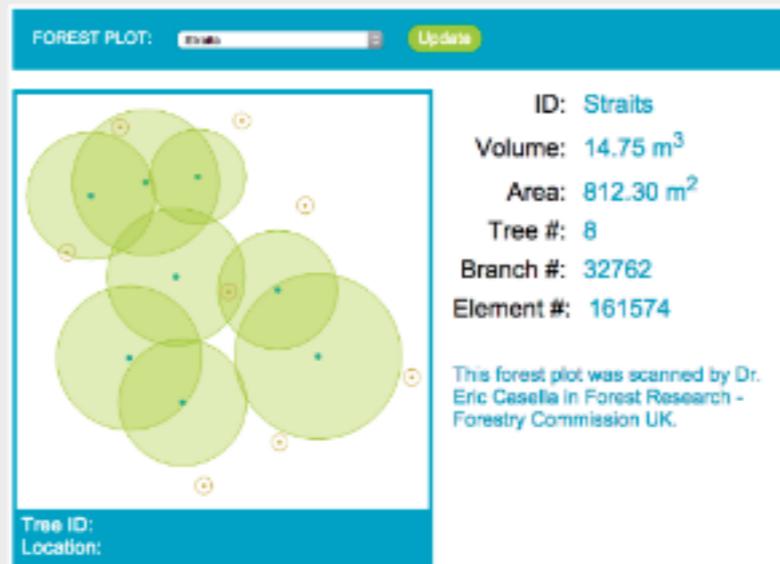
- When models are reconstructed
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- Updating is very simple

Augmenting

Tree gallery

math.tut.fi/inversegroup/treegallery

bit.ly/1FdG7HP



Augment

Tree gallery

math.tut.fi/inversegroup/treegallery

bit.ly/1FdG7HP

FOREST PLOT:

Straits

Update



ID: Straits

Volume: 14.75 m³

Area: 812.30 m²

Tree #: 8

Branch #: 32762

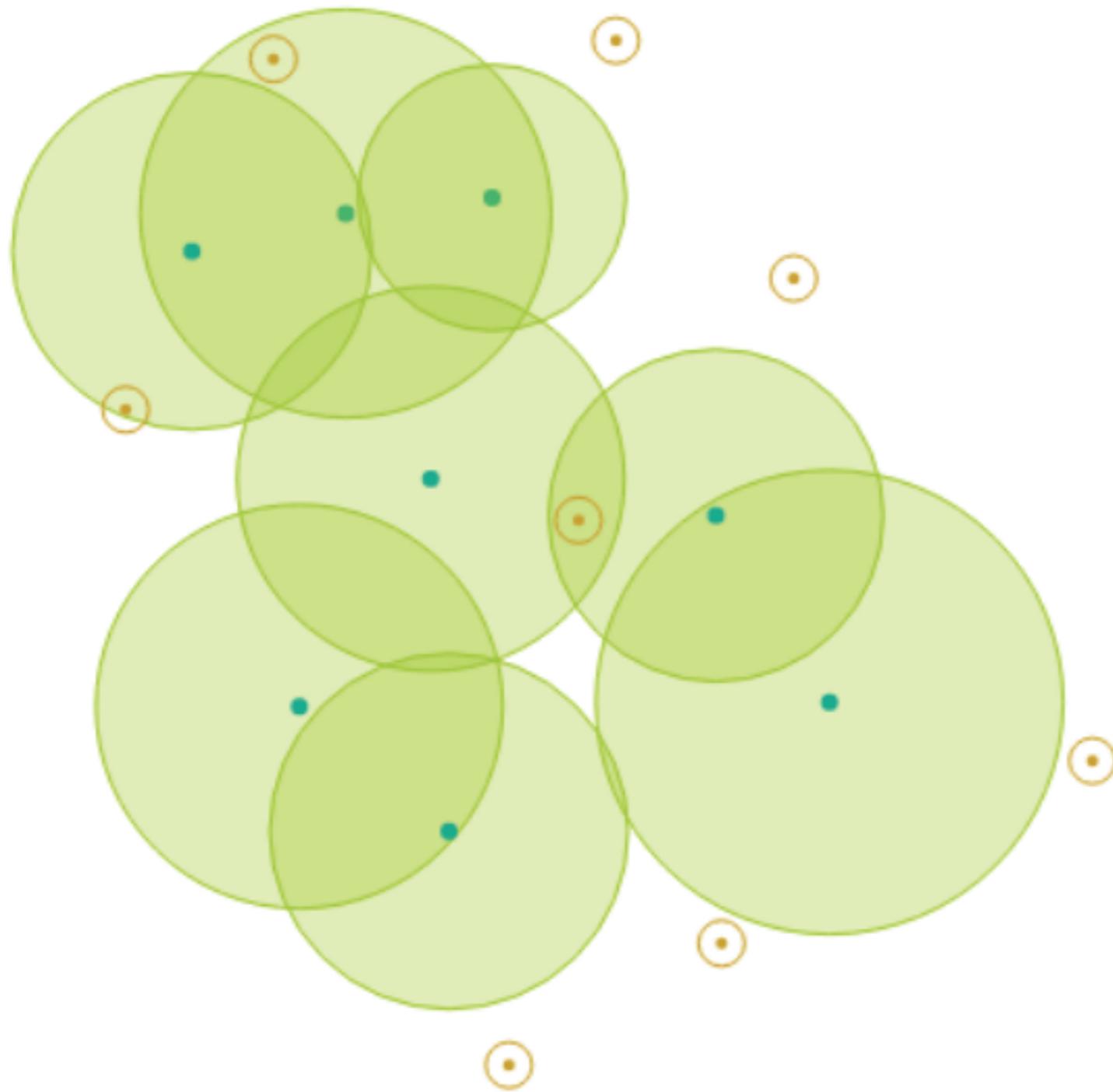
TRE

Straits

FOREST PLOT:

Straits

Update



ID: Straits

Volume: 14.75 m³

Area: 812.30 m²

Tree #: 8

Branch #: 32762

Element #: 161574

This forest plot was scanned by Dr. Eric Casella in Forest Research - Forestry Commission UK.

Tree ID:
Location:

TREE:

oak1

Update

Straits / Oak 1 More ▾



ID: oak1

Species: *English Oak*

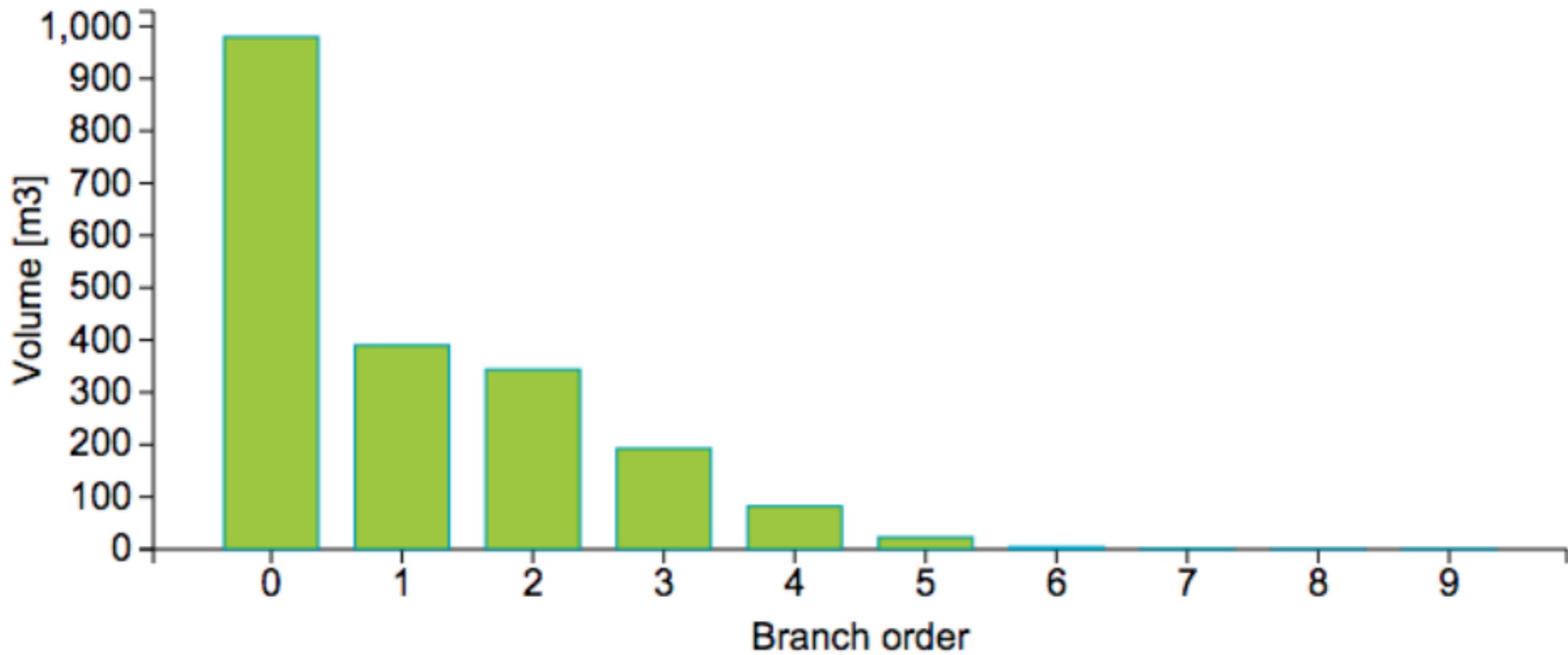
Volume: 2.02 m³

Area: 101.31 m²

Branch #: 2786

Element #: 15760

Branch size distribution



Branch

Element

Length

Volume

Area

Absolute

Relative

Where?

www.facebook.com/qualityforest
bit.ly/1Ary1Po



Who?

- Quality Forest Research Consortium (QFo)
- Finnish Environment Institute
- Natural Resources Institute Finland
- Finnish Geospatial Research Institute
- Tampere University of Technology



SOCIAL MEDIA

How?

- Publications
- Videos & pictures
- Field stories
- Centralized administration



Where?

www.facebook.com/qualityforest
bit.ly/1Ary1Po



The image shows a screenshot of a Facebook login page. At the top left is the Facebook logo. To the right are input fields for "Email or Phone" and "Password", with a "Log In" button. Below these are checkboxes for "Keep me logged in" and a link for "Forgot your password?".

Overlaid on the page is a promotional banner for the "QFo, Quality Forest Research Consortium" Facebook community. The banner features a colorful, abstract background of trees. The text on the banner reads: "QFo, Quality Forest Research Consortium is on Facebook. To connect with QFo, Quality Forest Research Consortium, sign up for Facebook today." Below this text are two buttons: "Sign Up" and "Log In".

Below the banner is the profile header for the "QFo, Quality Forest Research Consortium" community. It includes a profile picture (a black square with the letters "QFo" in green) and the name "QFo, Quality Forest Research Consortium" with "Community" underneath. At the bottom of the header are navigation tabs: "Timeline", "About", "Photos", "Likes", and "Videos".

Who?

- Quality Forest Research Consortium (QFo)
 - Finnish Environment Institute
 - Natural Resources Institute Finland
 - Finnish Geospatial Research Institute
 - Tampere University of Technology

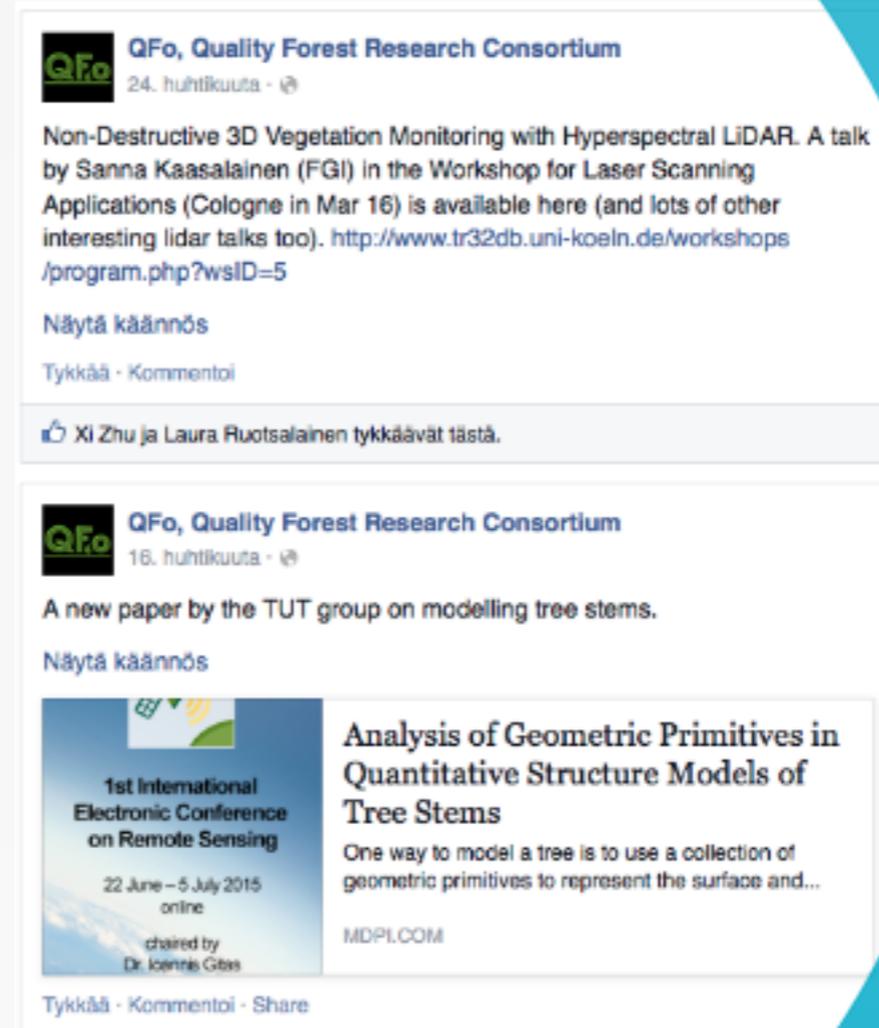


TAMPERE UNIVERSITY OF TECHNOLOGY

How?

- Publications
- Videos & pictures
- Field stories

- Centralized administration



QFo, Quality Forest Research Consortium
24. huhtikuuta · @

Non-Destructive 3D Vegetation Monitoring with Hyperspectral LiDAR. A talk by Sanna Kaasalainen (FGI) in the Workshop for Laser Scanning Applications (Cologne in Mar 16) is available here (and lots of other interesting lidar talks too). <http://www.tr32db.uni-koeln.de/workshops/program.php?wsID=5>

Näytä käännös

Tykkää · Kommentoi

Xi Zhu ja Laura Ruotsalainen tykkäävät tästä.

QFo, Quality Forest Research Consortium
16. huhtikuuta · @

A new paper by the TUT group on modelling tree stems.

Näytä käännös



1st International Electronic Conference on Remote Sensing
22 June – 5 July 2015
online
chaired by Dr. Jennie Gibbs

Analysis of Geometric Primitives in Quantitative Structure Models of Tree Stems

One way to model a tree is to use a collection of geometric primitives to represent the surface and...

MDPI.COM

Tykkää · Kommentoi · Share

tures

on



QFo, Quality Forest Research Consortium

24. huhtikuuta · 🌐

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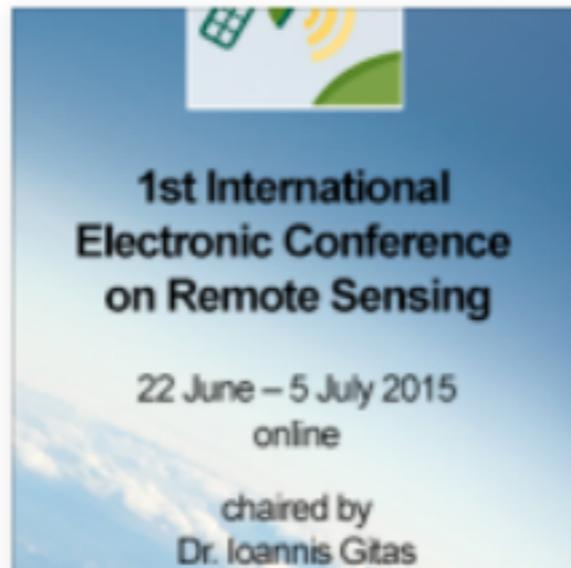


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Näytä käänös



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Tykkää · Kommentoi · Share

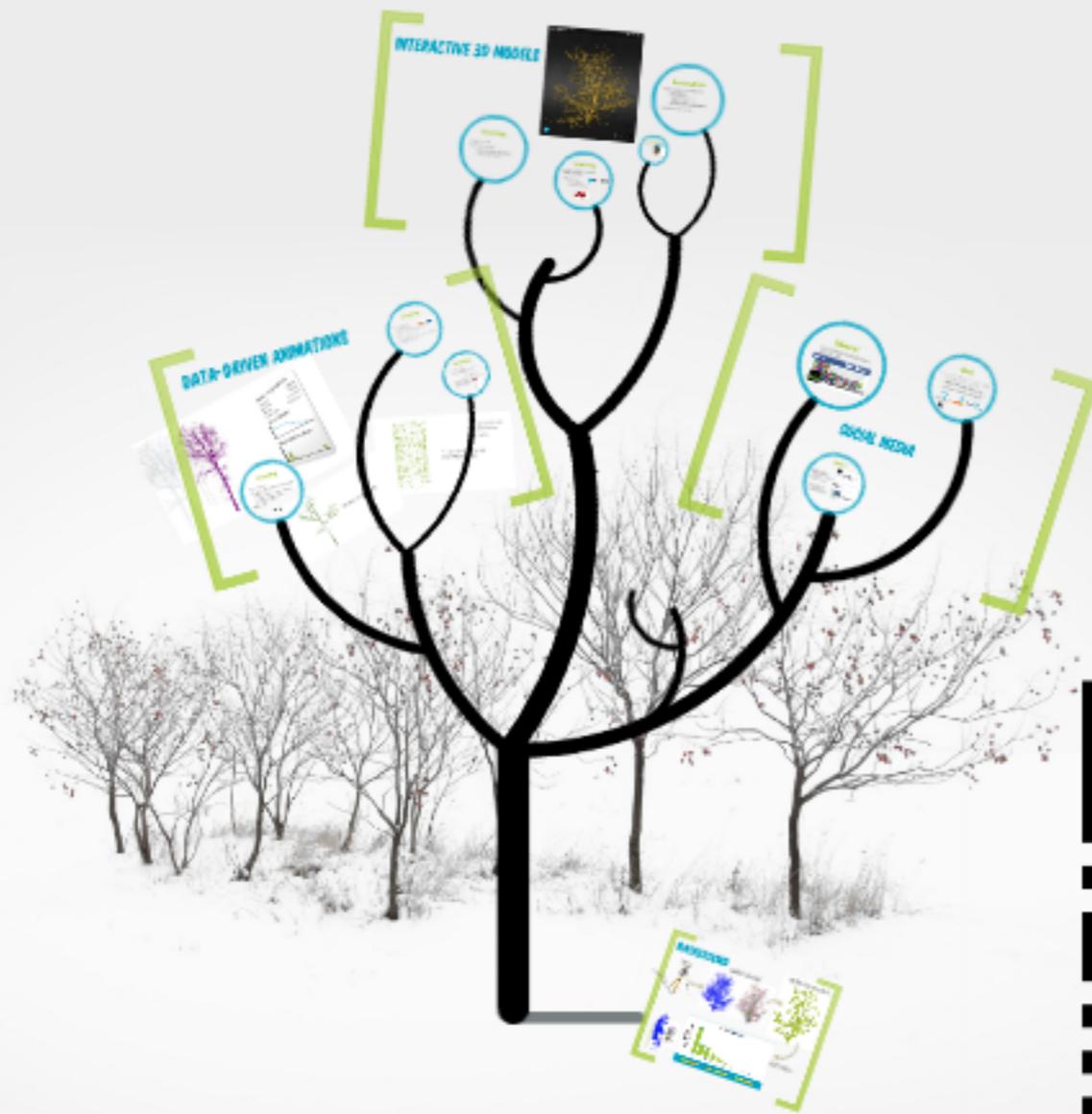
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