It's not *all* about research: mechanics of a successful applied biometrics program

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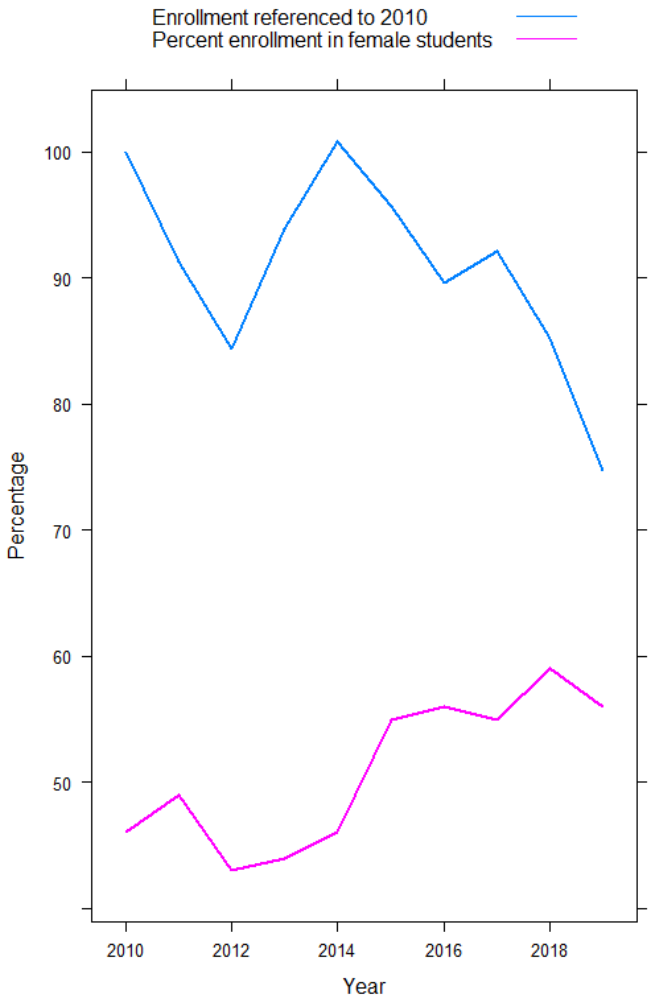
More than trees

- Opportunity statement
- What should applied research teams think about
- Demonstrated success
- Call to action for industrial research

OUR INDUSTRY IS CHANGING

- Policy and economic shifts
- Less vertical integration
- Increasing quantity of “bad data”
- Fragmented biometrics expertise
- Unbalanced age and diversity
- Lack of clarity on national priorities
- Costs on the rise at universities



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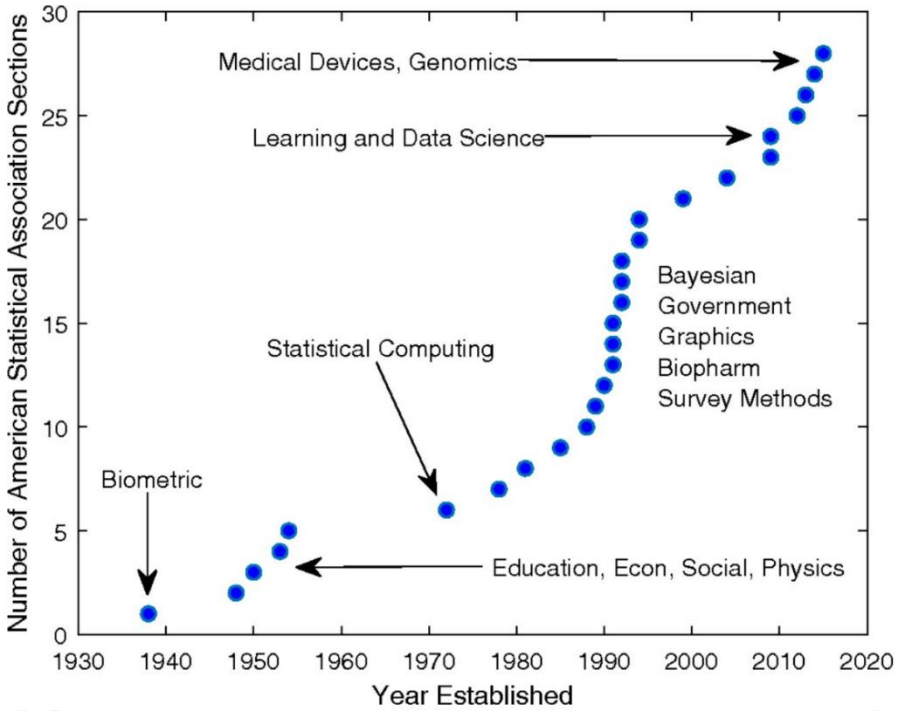
OUR FIELD BENEFITS FROM SCIENTIFIC ADVANCES

- Artificial intelligence
- Statistics
- Computing
- Remote sensing
- Material science
- Social media
- Collaborative tools



How science and technology developments impact employment and education, Proceedings of the National Academy of Sciences of the United States of America, Martinez (2018)

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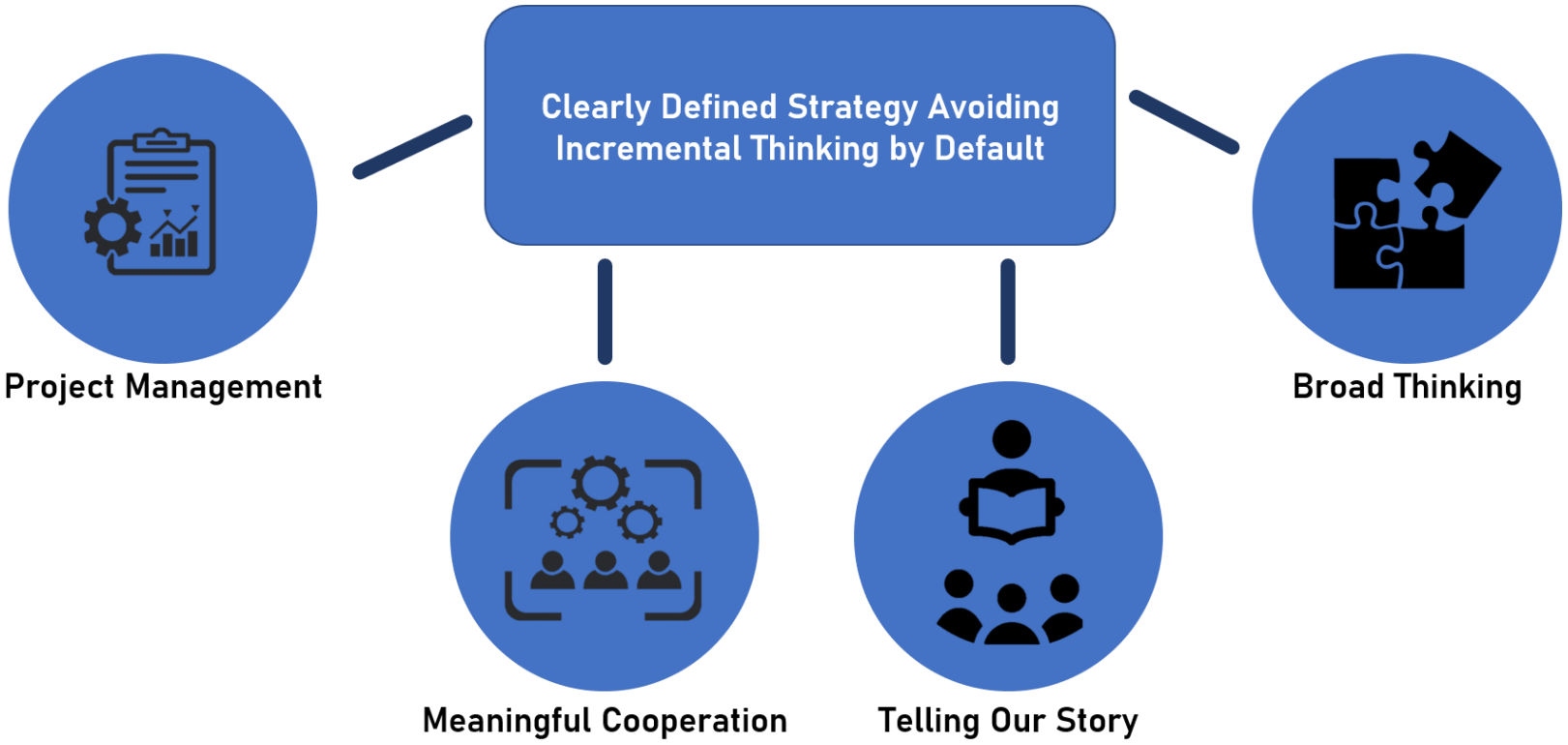
It's not *all* about research. Successful applied research teams will have to evolve in light of changes to the industry. While we face many challenges, thinking strategically about how we work together is key to continuity in our ability to advance understanding.

WHAT SHOULD SUCCESSFUL TEAMS THINK ABOUT

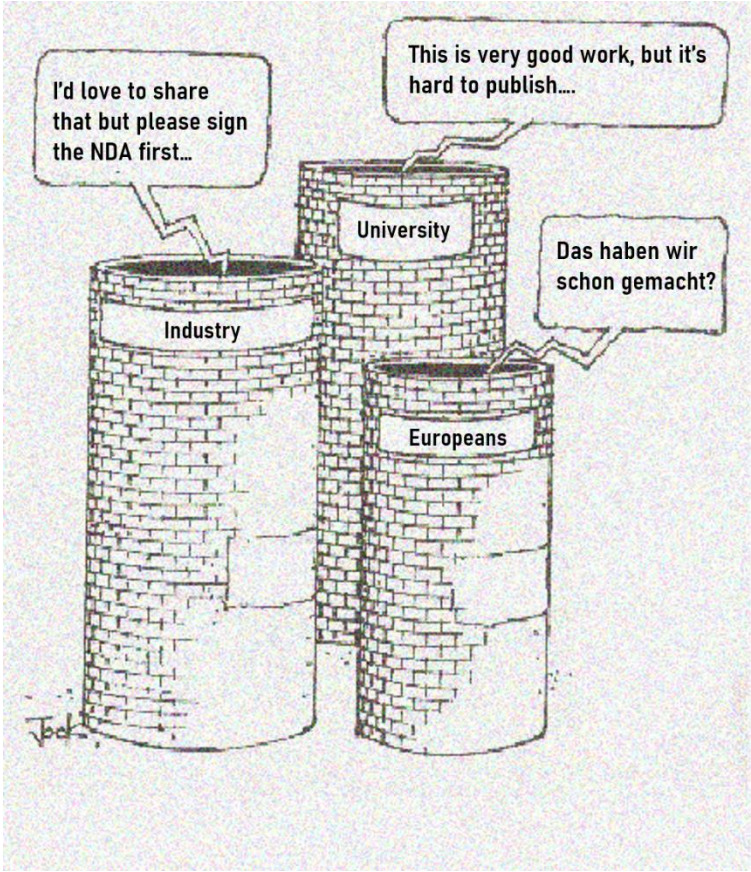


PROJECT MANAGEMENT TECHNOLOGY

Tool	Description
GitHub	Code sharing and project management tools
devtools	Simplified building of R packages
CRAN	Platform for sharing R based tools
Asana	Project management and coordination
Google	Developing shared documents

MEANINGFUL GLOBAL COOPERATION

- Prolific knowledge silos
- Minimal coordination across regional cooperatives
- Almost total separation from European R & D organizations
- Current incentives do not motivate experience or data sharing
- Not *all* information is sensitive, but we treat it that way
- Possible for industry to share in a meaningful way but it takes effort



TELLING OUR STORY

- Recruiting industrial forest biometricians is difficult
- An unbalanced age distribution continues to provide challenges
- How can we engage with high school and college students?
- Social media platforms are providing new ways to tell the story
- Get creative, get your foot in the door

CONSIDER IMPACTS ON THE SUPPLY CHAIN

What is the value signal for superior wood properties?

Producers

Consumers

Will silviculture regimes preserve current properties?

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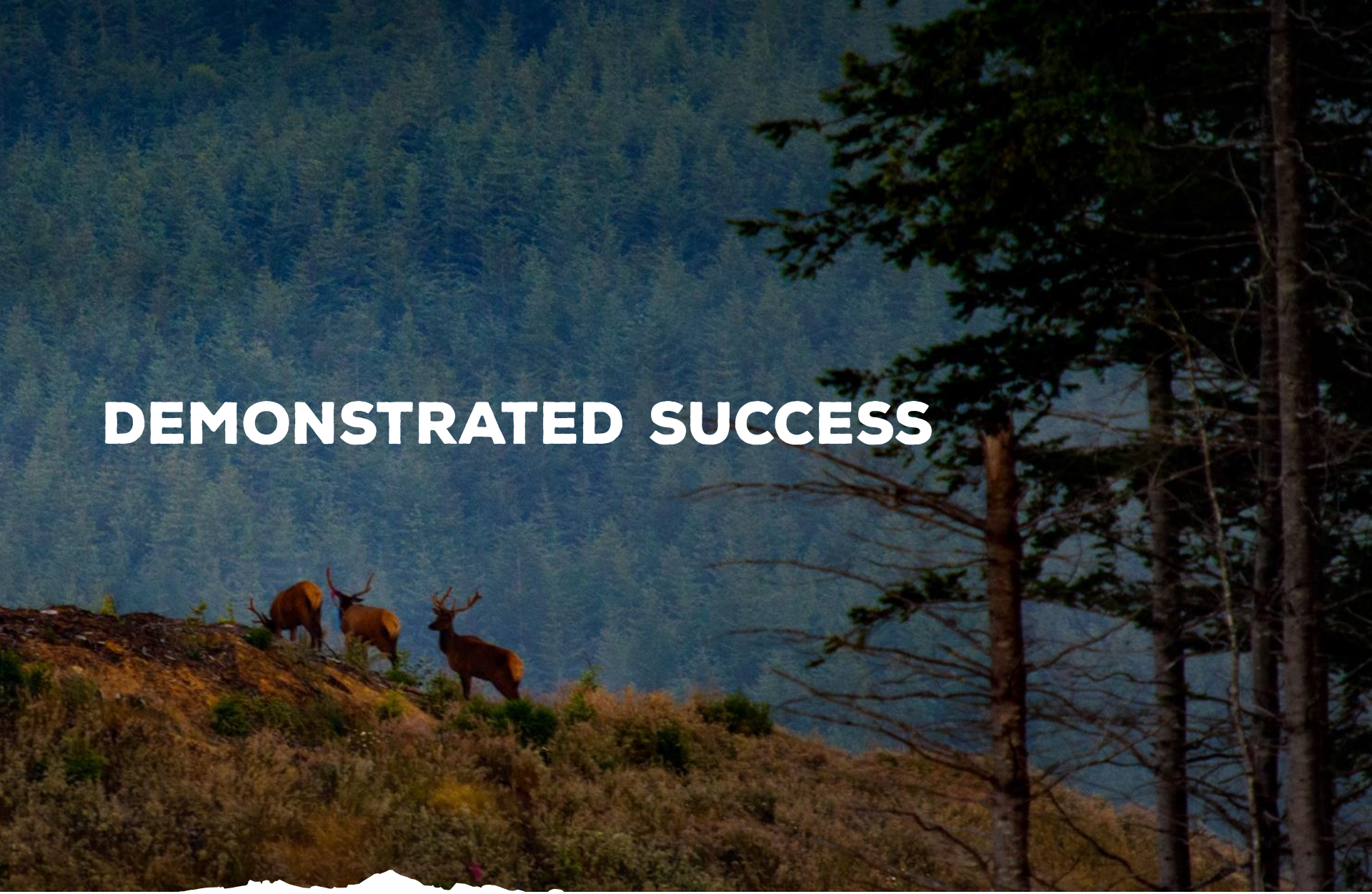
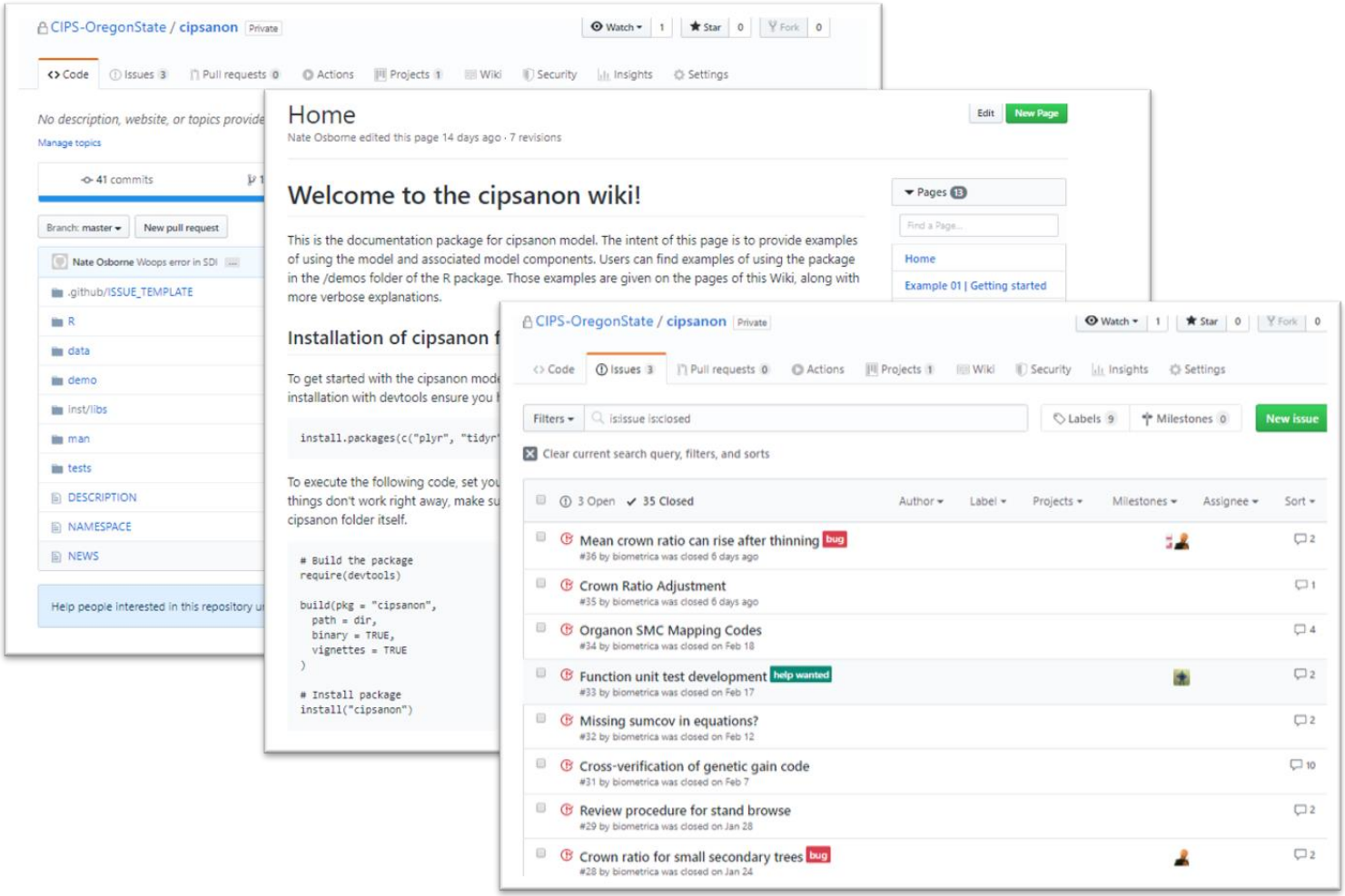

DEMONSTRATED SUCCESS

A NEW INTERFACE FOR THE CIPS MODEL



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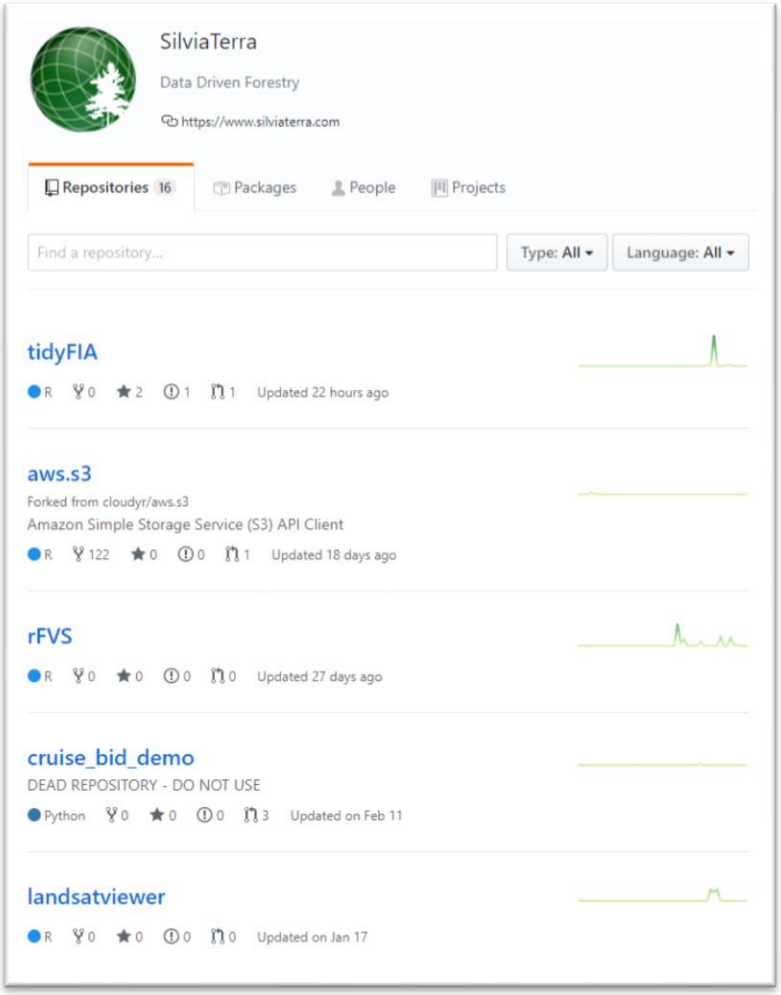
SILVIATERRA SHOWS INDUSTRY LEADERSHIP



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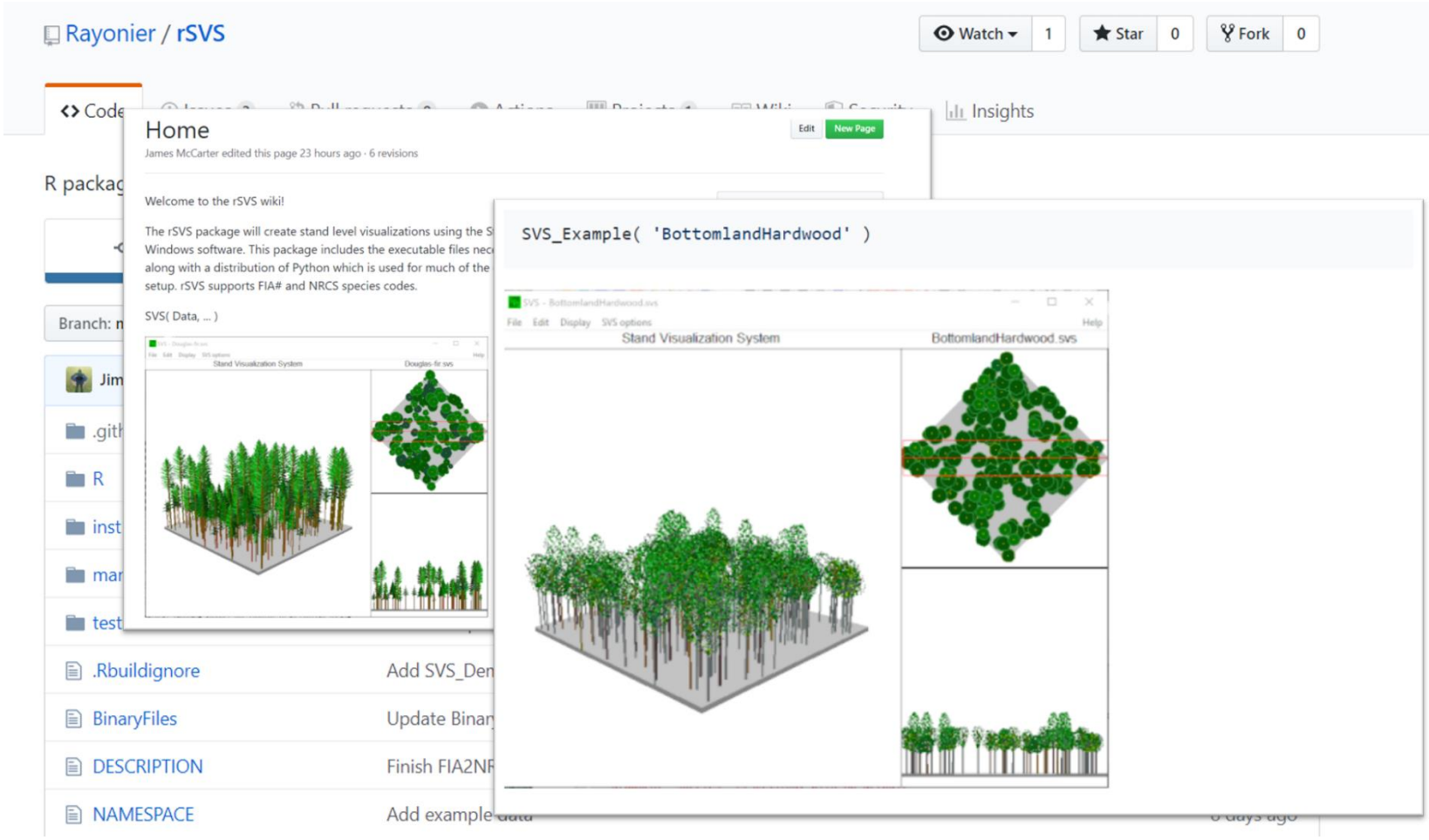
UNDERSTANDING MODELS USING PICTURES



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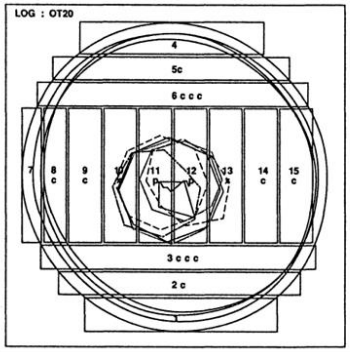
LINKING GROWTH AND QUALITY MODELS

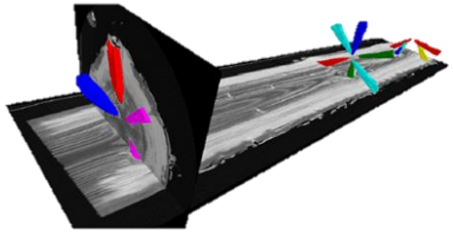
Forest inventory

Growth estimation



Sawing simulation

Distribution of lumber design values



Merchandizing forms a virtual log

Virtual log from Krähenbühl (2014) *Knot segmentation in 3D CT images of wet wood* & log sawing pattern from Todoroki (1990) *AUTOSAW system for sawing simulation* & forest from *rSVS*.

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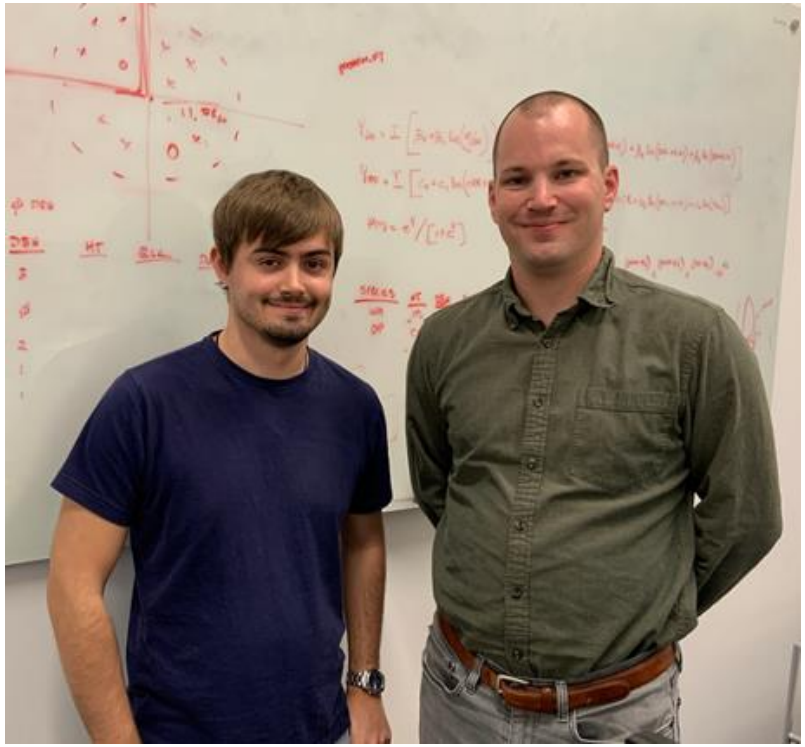
FINDING A WIN-WIN INTERNATIONAL PARTNERSHIP

- Université de Lorraine, AgroParisTech, INRAE
- UMR Silva, Nancy, France
- ExtraFor Est Programm
- CAPSIS platform
- Support from French LABEX Arbre
- Fit models using hierarchical bayesian structural approach
- GRETA and TensorFlow
- Finding a win-win project



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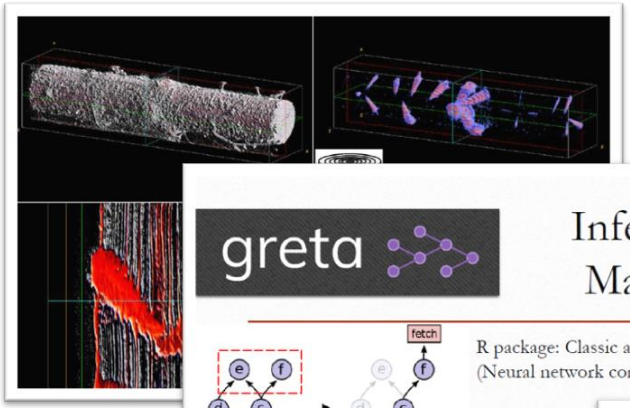
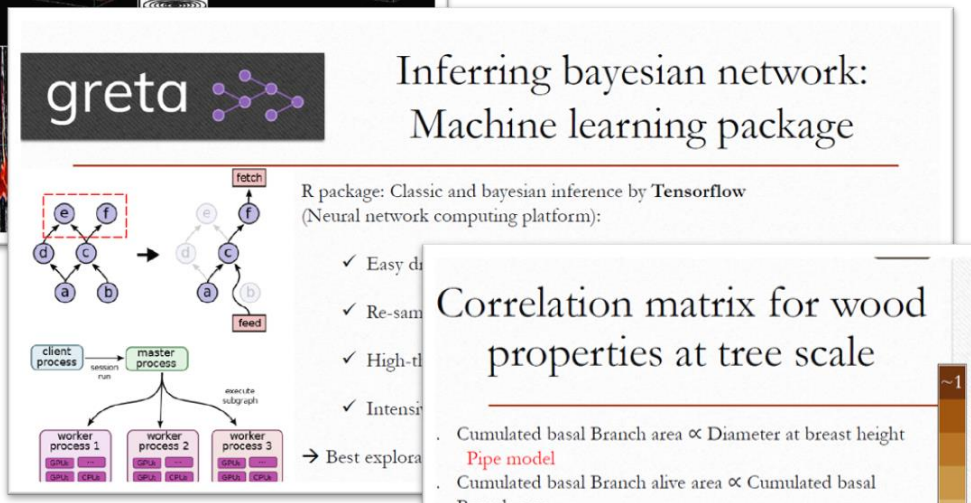
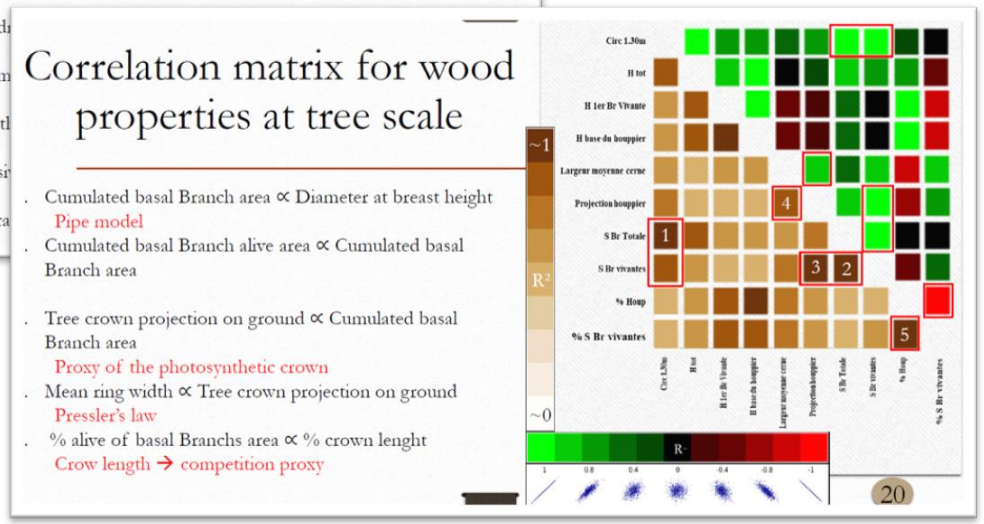
EVALUATING BIOLOGICAL REALISM OF MODELS







How can we adapt the Bakuzis matrix to evaluate if wood properties model chains refute or corroborate theories of wood formation?

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FORESTRY FIELD DAY AND BEYOND...

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SOUTHERN MENSURATIONIST SCHOLARSHIPS

This year we gave scholarships to Laura Ramirez, Daniel Boczniewicz, Ricardo Rodrigues de Oliveira Neto and Sunil Nepal. The recipients came from three universities, including the University of Canterbury. Funds were set aside to continue the scholarship program next year

CALL TO ACTION

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DOES THE PROJECT ADDRESS…

- A knowledge gap or incremental improvement?
- How improvement over the base rate is measured?
- A method to share results beyond a research note?
- Alignment with efforts outside the region?
- How to share results outside the profession?
- Implications on the broader supply chain?
- How to get continuous feedback from other teams?