Wood as a resource, from territory to material

ép. 1: the round wood
IBOIS, research laboratory: high-performance wood product and digitalization

Image: pavillon du théâtre de Vidy, Yves Weinand architecte, photo Ilka Kramer.
IBOIS, research laboratory: new value chain for wood products

Growth and cultivation

Harvesting

Half-products

Products

Design

Fabrication and installation

Growth and cultivation

Harvesting

Half-products

Products

Design

Fabrication and installation
IBOIS, research laboratory: system-based approach

- **PROJECT-BASED APPROACH**
  - CUSTOM SHAPE
  - REPEATED PROCESS
  - IBOIS

- **SYSTEM-BASED APPROACH**
  - CUSTOM SHAPE
  - REPEATED PROCESS
  - ARCHITECTS

- **MODULAR APPROACH**
  - REPEATED SHAPE
  - REPEATED PROCESS
  - CONTRACTORS

Image: IBOIS, scierie, Rossinière (CH), 2011.
Resource Sourcing: Rethinking the origin of materials


Transformation of Wood Resources: Prioritizing Unprocessed Use


Image: IBOIS, scierie, Rossinière (CH), 2011.
Applications and researches:
Design-to-Fabrication Workflow for Raw-Sawn-Timber using Joinery Solver (2017-21)

PhD student: Petras Vestartas
Director: Prof. Yves Weinand

How to minimize wood transformation by using scanned raw logs?
How to cut timber joints in round wood with a robot?
Applications and researches:
Design-to-Fabrication Workflow for Raw-Sawn-Timber using Joinery Solver (2017-21)
Applications and researches:
Design-to-Fabrication Workflow for Raw-Sawn-Timber using Joinery Solver (2017-21)
Wood as a resource, from land to material: Reinventing Log Architecture

Low-tech / high-tech
benefit from current research and innovative technologies for a raw material

Vernacular / Experimental
between tradition and innovation, defining the contemporary identity of log construction
> precedents : native habitat


Source: représentation de la cabane primitive, in « Essais sur l’architecture » (frontispice), Marc-Antoine Laugier, 1755.
> precedents: vernacular architecture and traditional construction
> precedents: Hooke Park

> precedents: structural experimentation and aesthetic research
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Wood as a resource, from territory to material
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> precedents

A corpus of work, documented as exhaustively as possible, will be the subject of an architectural, constructive and quantitative analysis specific to log construction. For the presentation of this first part, which will be organized in the form of a critique and an exhibition of the work, the following documents will be expected: a complete 3D Rhino model produced according to a predefined model; a physical model of a fragment at 1/10 scale; an exploded isometric representation (scale to be defined); a quantitative analysis according to a given table. The creation of these documents will also provide an opportunity, in the studio, to familiarize oneself with the representation of a material that is not commonly handled. Research and experimentation in 2D, 3D and scale models will be part of this first phase of study on the theme of round wood.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
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<tbody>
<tr>
<td>19.09</td>
<td>Presentation of IBOIS research</td>
<td>Round table presentation</td>
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<tr>
<td></td>
<td>Introduction &gt; precedents</td>
<td>Choice of case studies; formation of groups</td>
</tr>
<tr>
<td>25.09</td>
<td>Tour de table of selected case studies</td>
<td>Primary analysis (context, operating diagram)</td>
</tr>
<tr>
<td>26.09</td>
<td>Review of analysis hypotheses</td>
<td>3D sketches, drawings and models</td>
</tr>
<tr>
<td>02.10</td>
<td>Unlearning Center</td>
<td>In-depth analysis (construction and details)</td>
</tr>
<tr>
<td>03.10</td>
<td>Review of work with prof. Y. Weinand</td>
<td>3D sketches, drawings and models</td>
</tr>
<tr>
<td>09.10</td>
<td>Pre-presentation and validation of productions</td>
<td>Development of presentation material</td>
</tr>
<tr>
<td>10.10</td>
<td>Introduction to quantitative analysis documents</td>
<td>Completing analysis documents</td>
</tr>
<tr>
<td>16.10</td>
<td>Critique &gt; precedents (prof. Y. Weinand + guest)</td>
<td>Document archiving &gt; precedents</td>
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</table>
Wood as a resource, from territory to material
Ep. I: the round wood

> tree points cloud workshop

Prior to the project phase (> mock-up), a four-day group workshop will be held between 17 and 31 October. Supervised by Damien Gilliard and Andrea Settimi, researchers at the IBOIS laboratory, the workshop will involve creating digital models of trees using 3D scans of a plot of forest land. From capturing point clouds on site to sequencing the data using Rhinoceros 3D software and the Cockroach plug-in (developed by the IBOIS laboratory, Petras Vestartas and Andrea Settimi), this workshop will provide an opportunity to familiarize oneself with 3D scanning technology and the processing of this type of information with a view to implementing it in a design process.

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<tr>
<td>23.10</td>
<td>(program in progress)</td>
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<td>24.10</td>
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<tr>
<td>30.10</td>
<td>Review of work with prof. Y. Weinand</td>
<td>Creation of the database</td>
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</table>
> tree points cloud workshop

Image: IBOIS, points cloud, Rossinière (CH).
mock-up: detail

Source: atlasofplaces.com
mock-up: detail
> mock-up: architectural fragment
Wood as a resource, from territory to material
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> mock-up

By comparing one of the fragments analyzed in the case study with the 3D trees obtained during the workshop, the aim of the exercise will be to compose, in the theoretical form of a mock-up, a section of log architecture using innovative details. This composition will be the result of an in-depth study of the different assemblies, but also of a mastery of the overall constitution of the whole created. The assessment criteria will therefore cover both the technical development and the understanding of the symbolic significance of the project. The second part of the project will be presented in the form of a critique and exhibition of all the work produced during the semester. The exhibits will consist of 2D and 3D representations, scale models and, where appropriate, 1/1 scale prototypes.

> presentation materials to be defined
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<tr>
<td>06.11</td>
<td>07.11 Lecture / conference</td>
<td>Project development</td>
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<td>14.11 Studio work / individual critique</td>
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<td>04.12</td>
<td>05.12 Lecture / conference</td>
<td>Project finalization</td>
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<td>11-15.12</td>
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Wood as a resource, from territory to material
Ep. II : a woodworking school in the french alps

> program

“The Haute Ecole du Bois et de la Forêt (HEBF) will support the transition of the forestry and wood-building sectors by developing the skills that will underpin the strategic thinking of tomorrow’s companies and managers.

Three points of interest:
1. European dimension: project backed and supported by a European association made up of institutional/industrial/prescriber/research center/training center members and partners.
2. Multi-disciplinary training courses on site: ‘wood’ and ‘forest’, links with architecture and construction schools in Europe;
3. Site located at the heart of the Alpine-Mediterranean resource: proximity to natural and economic resources, culture/identity, high development stakes for the industry.

HEBF aims to support the forestry sector’s need for higher skills; to diversify and energize the industrial/territorial economy; and to create enriching collaboration with the countries of the Alpine arc in order to participate in the development of the Alpine-Mediterranean forestry-wood industry.”

Communiqué de presse, 2022.

The second-semester project exercise will focus on the design of one of the buildings on the HEBF campus. The knowledge acquired during the first semester in the form of mock-ups will form the technical and architectural basis for the development of an exemplary and innovative log project.
team :
Professor Dr. Yves Weinand
Damien Gilliard (arch.-ing., PhD candidate)
Agathe Mignon (arch., PhD, scientific coll.)
Andrea Settimi (arch., PhD candidate)

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