LAPIS
ART OF SCIENCES LABORATORY

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The core teaching aim of the LAPIS Laboratory is to train future architects in the specialist field of image analysis, synthesis and processing. Every year, between 600 and 700 students attend the courses run by the Laboratory, which include around 200 contact hours and 100 hours of practical work.

DIGITAL TRANSITION AND ANALOGICAL CONTINUITY

The Art of Sciences Laboratory (LAPIS), founded in 2013 by Nicola Braghieri, investigates the processes of representing scientific thought through figurative tools offered by artistic disciplines. The laboratory's scientific mission is to investigate the role of implicit knowledge derived from analogical practices in the explicit automation of production processes. Therefore, research and teaching activity explores theoretical and practical implications of handcrafting specifically in the field of digital representation (image analysis, synthesis and processing), while developing strong cultural foundations and critical independent thinking. The virtual representation of architecture, city and territory is cast as a humanist discipline that questions the very nature of design and the definition of the architecture discipline. LAPIS main research axes are the following:

☞ *Archeological Drafting & Vernacular Heritage*
☞ *Architectural Drawing & Digital Fine-Arts*
☞ *Analogue Design & Compositive Practices*

I. ARCHEOLOGICAL DRAFTING
& VERNACULAR HERITAGE

The laboratory has inherited EPFL's long-standing tradition of studying vernacular and monumental heritage. Since 2014, fifteen analysis campaigns were carried out on architectural heritage across country involving more than 500 technicians and students in field investigation. Such campaigns have enabled LAPIS to develop a new system of 'representation codes' and 'standards' that integrate, in a coherent way, the 'traditional' graphic conventions of hand-drawing with new technologies of automatic surveying. In the Swiss alpine context, this system of representation has been used as an operative research tool to investigate the relationship between building typology and urban morphology. Overseas, experimentation is underway at an active archaeological site in Kom Ombo, Upper-Egypt, where a survey campaign is currently conducted, and at the Easter Islands where a survey campaign is carried out in collaboration with the FAR Laboratory. LAPIS' position is clear; it is only through an active process on knowledge acquired through representation and rooted in the territory, that architecture has a chance at being safeguarded and restored.

PG, Models of Isérables' Raccards, granaries and barn-stables, 2017

1.a Atlas Vernaculi

The laboratory focuses on questions relating to the representation, archiving and classification of vernacular heritage in the production of knowledge of the nineteenth and twentieth centuries, both in architecture and in related disciplines. Various interpretations of the vernacular aim to provide answers to the increasing loss of meaning of the built environment; a loss caused by intertwined problems such as increasing pollution, accelerated modern development, the disappearance of the historic city and uncontrolled urban sprawl. The relevance of vernacular structures, not as static objects, but as evidence of a different building process, is central to the laboratory's research, and it is only by addressing the processes by which meaning is 'produced' that architecture as a discipline can operate a qualitative shift in its current sustainability paradigm.

Projects:

☞ *Silent Transformations : Study on Alpine Architecture - Doctoral Research - Patrick Giromini*
☞ *In Quest of Lost Meaning: Vernacular Architecture and the Environmental Awakening - Doctoral Research - Vasileios Chanis*
☞ *Digital Palimpsest & Composite Rural Heritage (Open-source Digital Platform)*

VC, Critical Bibliography on Vernacular Architecture, 2022

1.b Critical Surveying

Since the 1960s, EPFL has continued to study anonymous architecture through the active process of architectural surveying. This in-depth research has been inherited by LAPIS, which has since contributed to its development and dissemination. Through systematic research in the field, the laboratory aims to develop new synergies between automatic digital survey methods and those of artisanal drawing, for both rural Alpine buildings and 'delicate artefacts'. Once documented, these buildings will be geo-referenced and organised according to morphological, typological and constructive criteria in an interactive and evolving database — a palimpsest devised through analogy. The project encourages a critical awareness of the choices involved in transforming the territory, by means of tools designed for all those involved in the construction and conservation of the Alpine landscape. The promotion of 'lesser knowledge' as a cultural horizon by planning, development and heritage control institutions is a key element in the sustainable development of the region.

Projects:

☞ *Human habitat : a study on the Alpine territory (bachelor's course 2nd year, 2016/2024)*

☞ *Architectural study and restitution of the Greco-Roman temple of Sobek and Haroeris in Kom Ombo, Upper Egypt - FNS Research - Aurélie Terrier*
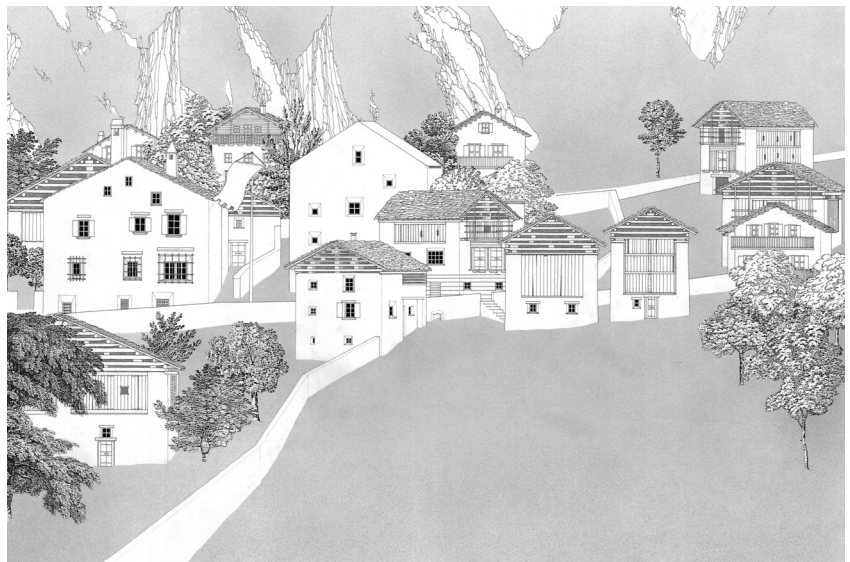
Surveying Campaign, Soglio (GR), 1992-2024

2. ARCHITECTURAL DRAWING & DIGITAL FINE-ARTS

LAPIS' primary objective is to advance digital practices in architectural representation while sustaining a continuous dialogue with the figurative tradition, both in the pictorial pursuit of truth and architectural drawing in its speculative and timeless dimension. A major contribution to this field is the development of a specific operational method for both analysis of artworks and teaching of representational techniques oriented towards the discipline. A central endeavour is the investigation of the theoretical and practical implications of Digital Transition, with a particular emphasis on training present and future architects in specialised fields such as image analysis, synthesis, and processing. Our ambition is to contribute to the discourse on the methodology of representation by redefining the visualisation process exploring the inner dialogue between analogue and digital tools.

NB, La Chaux-de-Fond, Collage Perspective, 2022

2.a Scaena Domestica

Through the digital reconstruction of selected masterpieces, LAPIS conducts operational analyses to explore the potential impact of figurative art not only on representation but also on the conception of architectural projects. The aim is to analyse, reconstruct, synthesise, and predict physical phenomena, particularly those stemming from design choices. This investigation focuses on architectural language and spatial relationships, compositional tropes between domestic objects and related viewpoints, and resonance between materials and specific atmospheric conditions. Spanning from reverse perspective to rendering, the architectural deconstruction of the work of art becomes a tool for reading architectural space and built form in their historical and constructive dimension. From the domestic interior seen through the eye of the artist, this analytical procedure visually depicts a social history of housing by redefining typological elements and topological characters in dwelling culture. By use of digital model making, Physically Based Rendering softwares, and manipulation techniques alongside traditional "analog" photography of physical models, a dialectic between artistic expression and tangible reality authorial verisimilitude is thus achieved. The outcome of this process is the construction of "verisimilar" representations, plausible depictions of architectural ideas.

Projects :

☞ *FIRE (bachelor's course 2ⁿᵈ year, 2013/2024)*
☞ *The Sky in a Room, Domestic Landscape and Synthetic Fine Arts (Exhibition and Publication, EPFL, 2023)*

FF, Reconstruction and Deconstruction of Johannes Vermeer, the Music Lesson, 2023

2.b Digital Analogy

The research aims to provide a critical reading of the history of computer-aided-drawing practices, questioning the possible continuity of Renaissance representational languages and techniques in the use of contemporary digital tools. It proposes to understand the evolution of the architectural drawing processb by investigating the relationships between architecture, industry and computation. In brief, the research seeks to situate the technical history of computer-aided figuration in a broader cultural perspective.

Project(s) :

Emma Larcelet

☞ *Analog and Digital: Addressing the continuity of architectural drawing practice in the design process - Doctoral Research - Emma Larcelet*

NB, Anticamera per architetti superbi, 2016

3. ANALOGUE DESIGN & COMPOSITIVE PRACTICES

LAPIS investigates the theoretical and practical implications of compositive practices as a design methodology in arts and architecture.

The laboratory provides a practical take on the Aristotelian concepts of 'analogy' and 'verisimilitude' by developing a dialectical approach to design based on revealing affinities and composing fragments. Rural and urban repertoires become the subject of inquiry with their long history of representation, and the methodological framework for the design approach. The analogue method involves a continuous comparison between the territory as a living archive, its figurative representation and its literary vision. For architects, the existing environment becomes a fertile ground for the imagination, in which the accumulation of layers and objects provide the physical and intellectual basis for a project on habitat. The understanding of territory as a collage of fragments becomes a paradigm for a broad investigation on processes of design and 'good governance.'

FF, Ecclesia Triumphans. Ruins as a frame for a discourse on God, 2022.

3.a Locus Utopico

Architecture, more than other sciences and more concretely than other arts, has been able to produce fascinating images of an everyday future that is particularly radiant and full of hope. The age-old adventure of utopian thinking, between truth and verisimilitude, is conveyed through a phenomenological reading of examples from the fantastic repertoire offered by architectural projects and literary descriptions. LAPIS research and teaching aim to investigate the theoretical and practical implications of image analysis, synthesis and processing within the production of graphic works composed of visions of a utopian world between dream and reality. The paradox and verisimilitude embedded within these works highlight the dialectical and rhetorical power of architecture particularly in today's society obsessed with images as end products rather than means to convey larger ideas.

Projects :

☞ *VETU (Course then UE en Master, 2013/2024)*
☞ *Archive de l'imaginaire (Open-source Digital Platform)*
☞ *Promenades dans Rome — Assembly practices between visions, ruins and reconstructions (Workshop, Symposium, and Publication, 2023)*

Allégorie des plumes or La vêture de Son éminence le douzième prélat d'Amauroto, Render, work sample, FF, 2018

3.b Alpine Habitat

Imagery is a tool fundamental to and indissociable from the architectural design process. Images are not only a graphical representation of design ideas but are also an eloquent means of communicating the shape and the materials to be used in a construction.

Since its foundation in 2013, LAPIS has been actively involved in operative research about the 'alpine house' specifically directed at investigating the relationship between building typology and urban morphology in the rural mountainous area. In particular, it has carried out extensive research into the elements and characteristics of domestic and functional buildings in the Alpine environment. This comprehensive study of Swiss architectural heritage inevitably delves into the most critical condition that characterises vernacular buildings today; that of abandonment. This condition becomes the premise of LAPIS design studios, inviting the students to critically envision the re-population of neglected Alpine areas through the architectural project. Indeed, the project is thought of as a critical tool and a practical device. One for respectively reading the territory in its cultural and material forms, and affirming a political vision capable of directing the course of its transformations. The project becomes an experimentation ground towards sensible and sustainable strategies in an inherently hostile environment.

Projects :

☞ *ATELIER (Studio BA5, MA1 2021/2024)*
☞ *"Handcrafting Digital Transition" Superonda Spring 2024*

NB, Analogical Trainstation, Collage Perspective, 2022