EPFL, Lausanne, Switzerland

Civil Engineering Education In Switzerland

Ian F.C. Smith

Applied Computing and Mechanics Laboratory
Ecole Polytechnique Fédérale de Lausanne (EPFL)
Lausanne, Switzerland

Vancouver, Canada November 2007

EPFL, Lausanne, Switzerland

EPFL, Lausanne, Switzerland

A long tradition

1853 Creation of the « Ecole spéciale de Lausanne »

1946 - 1968 EPUL - Ecole Polytechnique de l'Université de Lausanne

Since 1969 EPFL - Ecole Polytechnique Fédérale de Lausanne

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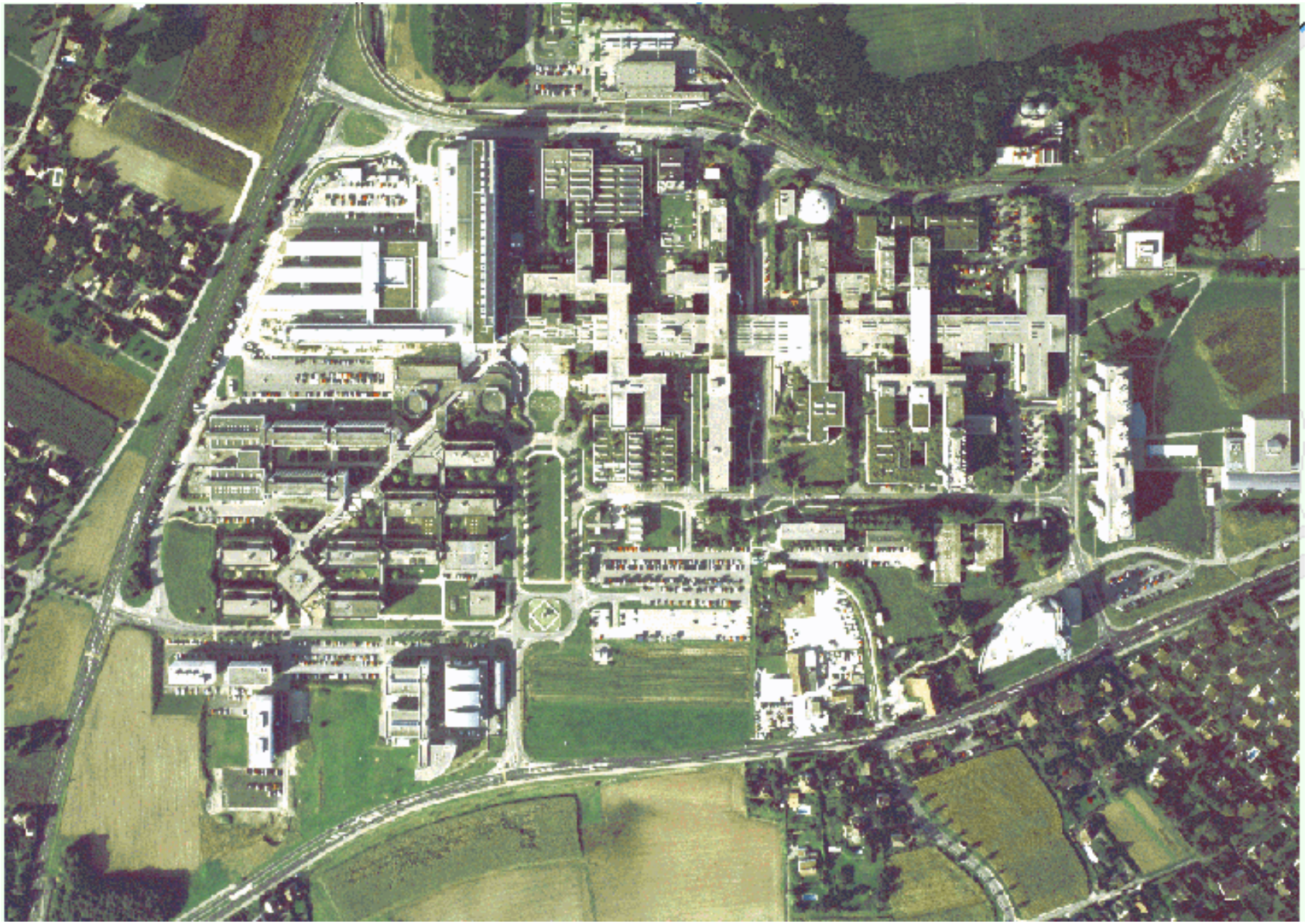

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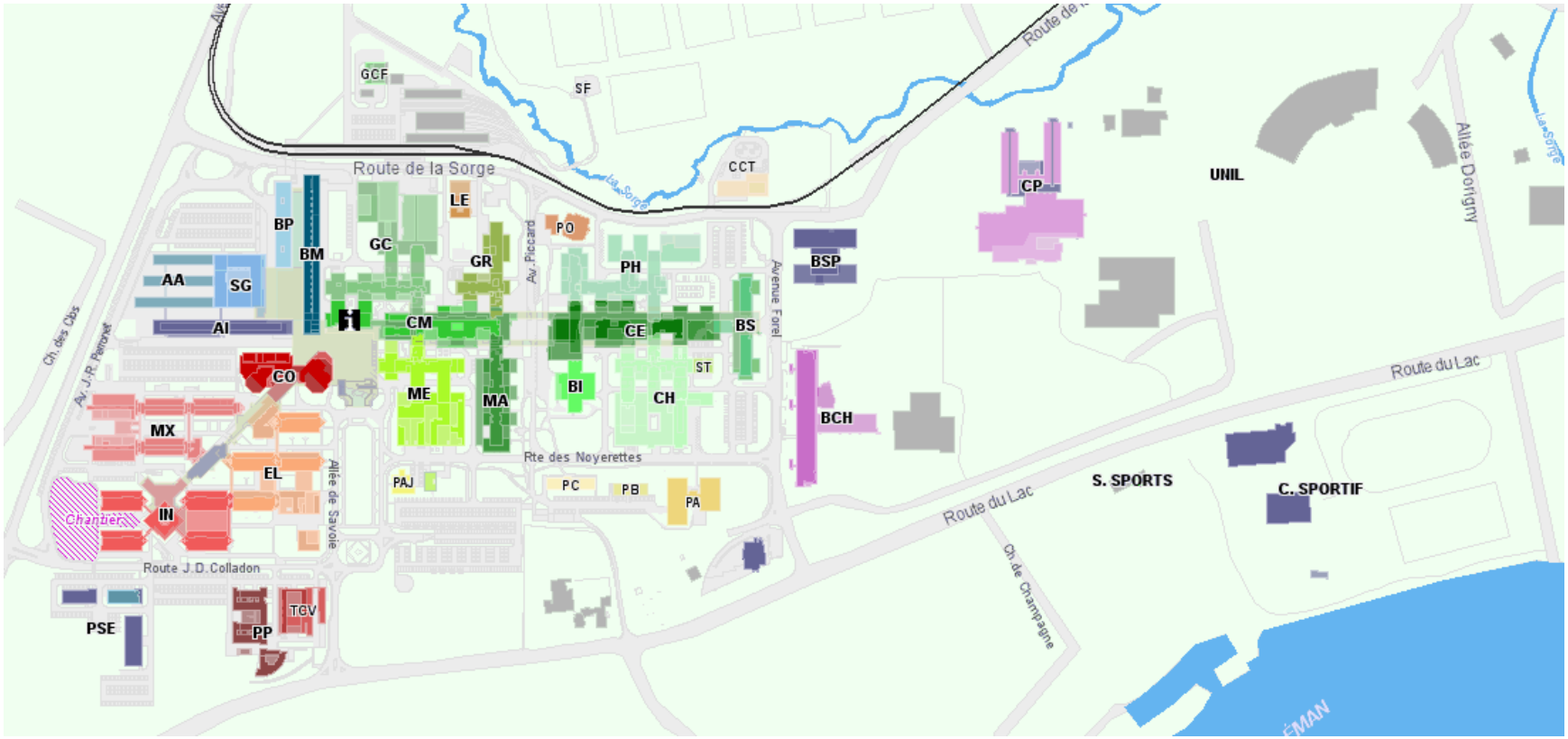


EPFL in 2007

5 schools + 1 college

Architecture, Civil and Environmental Engineering

Basic Sciences

Computer and Communication Sciences

Engineering Sciences

Life Sciences

The College of Humanities

A community of 10,000 people

7,742 students and doctoral candidates

2,424 scientific, administrative and technical staff

245 professors

Budget : CHF 587 million (1/3 soft)

ENAC

School of Architecture, Civil and Environmental Engineering

ENAC's Mission

The application of research results to tasks involving society, resources, the economy and the environment






Design and Build Together

Learn to know each player

Share knowledge

Construct together

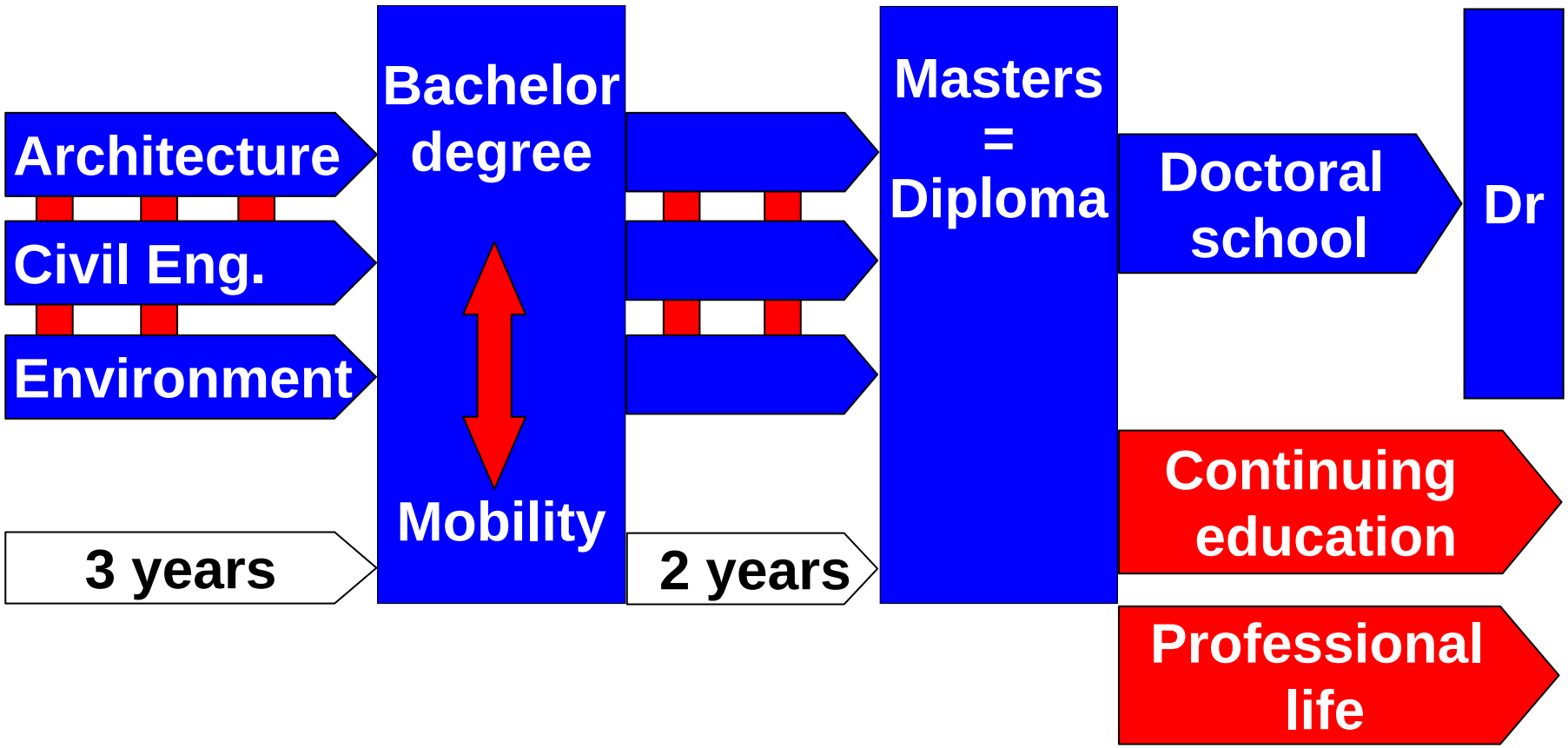






ENAC Teaching

Three degrees at three levels

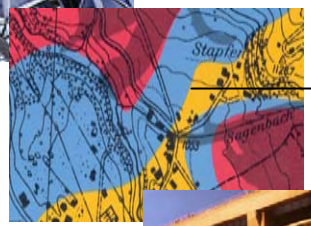


ENAC Research

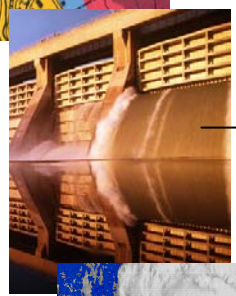
Institutes

IA — **Architecture**

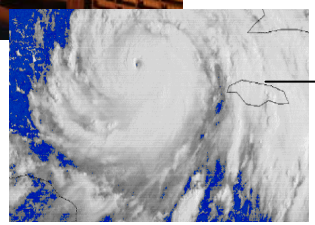
IS — **Structural Engineering**



INTER — **Urban and Regional Planning and Design**



ICARE — **Infrastructure, Resources and Environment**



ISTE — **Environmental Science and Technology**

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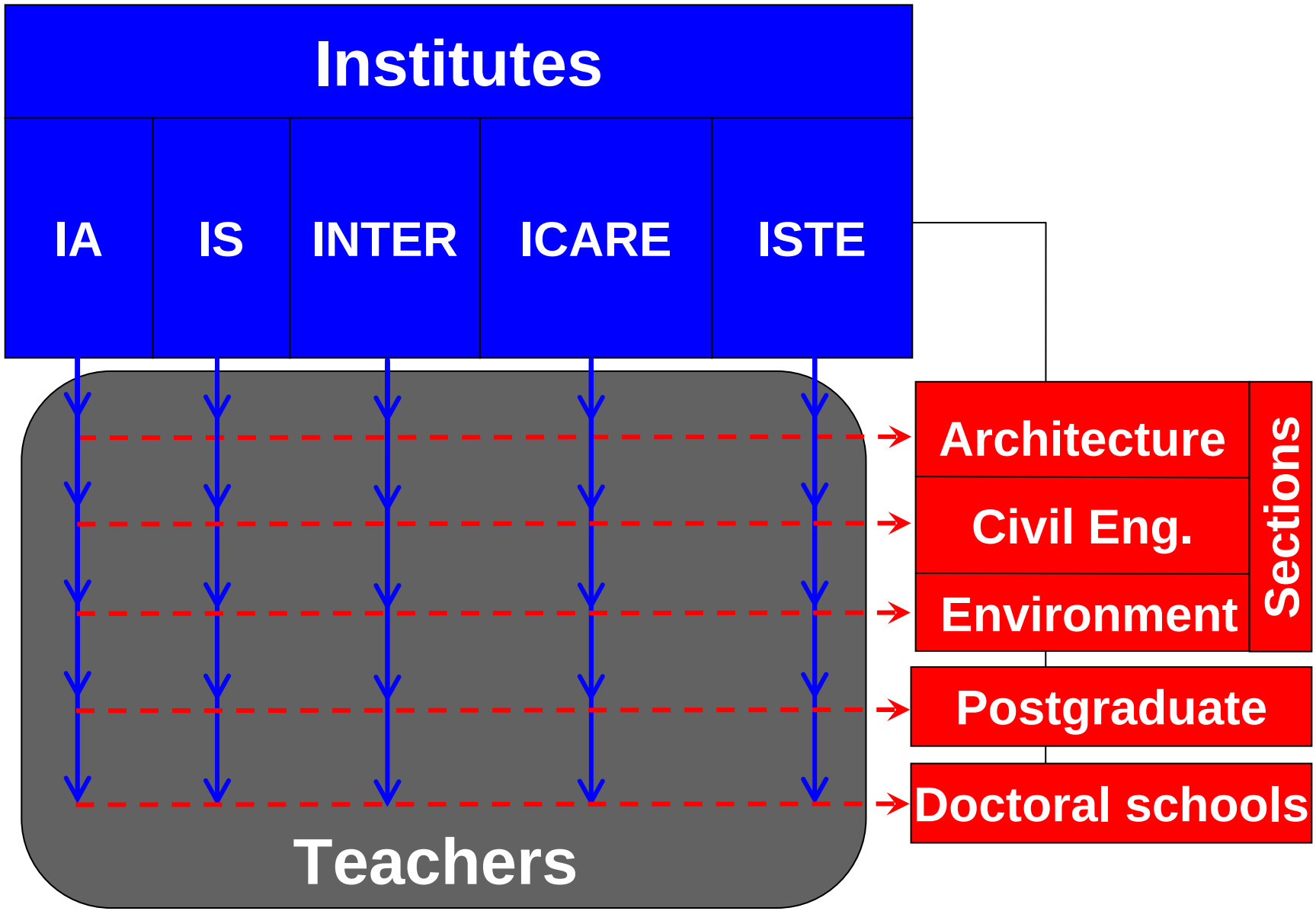

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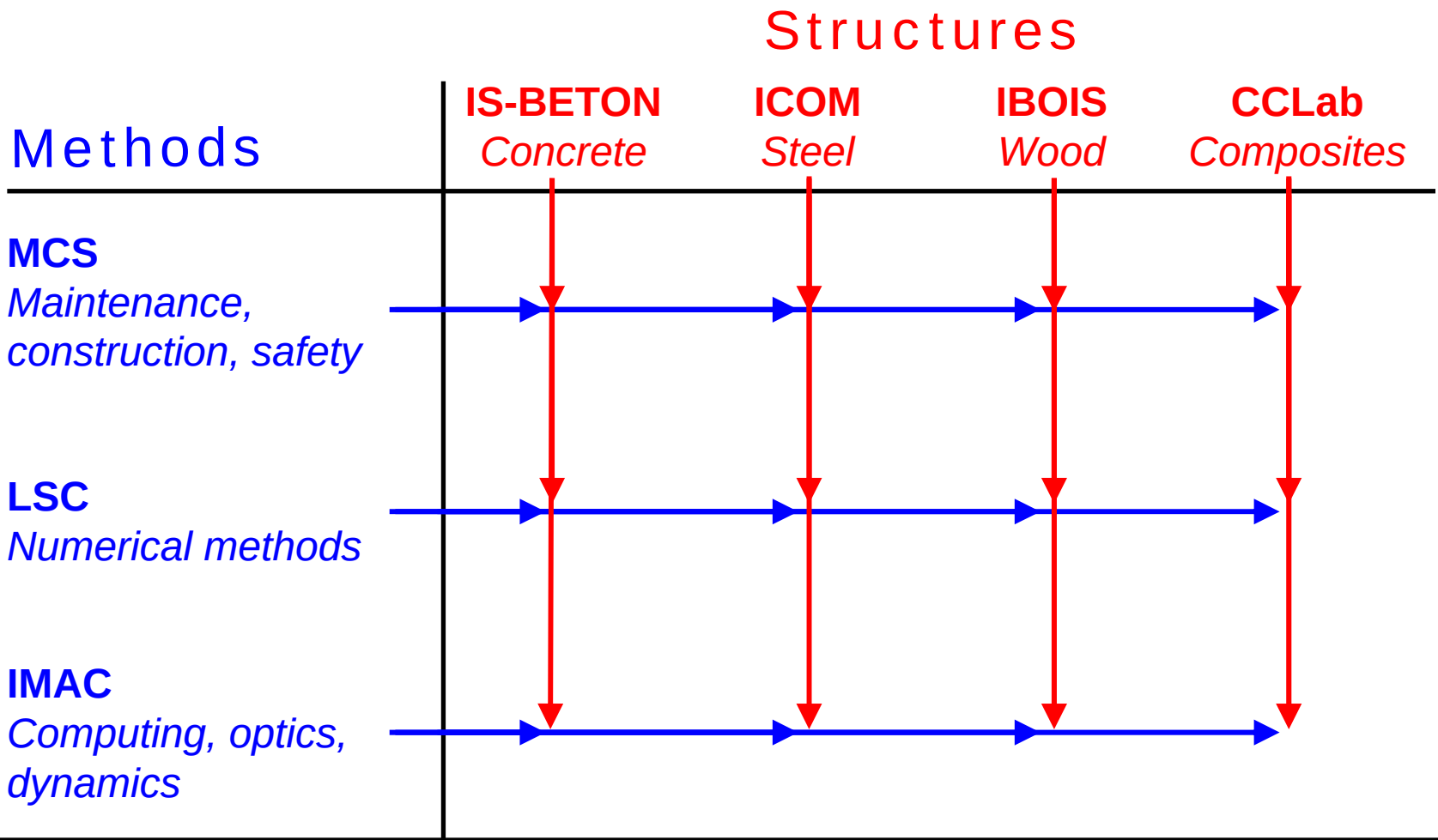
Structural Engineering Institute

Seven labs, two orientations



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Newsweek International Edition

The Top 100 Global Universities, 2006

1.	Harvard University	USA
2.	Stanford University	USA
3.	Yale University	USA
4.	California Institute of Technology	USA
5.	University of California at Berkeley	USA
6.	University of Cambridge	GB
7.	Massachusetts Institute Technology	USA
8.	Oxford University	GB
9.	University of California at San Francisco	USA
10.	Columbia University (New York)	USA
11.	University of Michigan at Ann Arbor	USA
12.	University of California at Los Angeles	USA
13.	University of Pennsylvania	USA
14.	Duke University	USA
15.	Princeton University	USA
16.	Tokyo University	J
17.	Imperial College London	GB
18.	University of Toronto	CAN
19.	Cornell University	USA
20.	University of Chicago	USA
21.	Swiss Federal Institute of Technology in Zurich	CH
22.	University of Washington at Seattle	USA
23.	University of California at San Diego	USA
24.	Johns Hopkins University	USA
25.	University College London	GB
26.	**Swiss Federal Institute of Technology in Lausanne**	**CH**
27.	University Texas at Austin	USA
28.	University of Wisconsin at Madison	USA
29.	Kyoto University	J
30.	University of Minnesota Twin Cities	USA

EPFL No. 6 in Europe

Academic Ranking of World Universities

Top 100 world universities in Engineering/Technology and Computer Sciences, 2007

1.	Massachusetts Institute of Technology (MIT)	USA
2.	Stanford University	USA
3.	University Illinois - Urbana Champaign	USA
4.	University Michigan - Ann Arbor	USA
5.	University California – Berkeley	USA
6.	Pennsylvania State University - University Park	USA
7.	Georgia Institute of Technology	USA
8.	University Texas – Austin	USA
9.	University California - San Diego	USA
10.	Purdue University - West Lafayette	USA
11.	University California - Santa Barbara	USA
12.	University Southern California	USA
13.	University Maryland - College Park	USA
14.	Carnegie Mellon University	USA
15.	Cornell University	USA
16.	University Cambridge	UK
17.	Tohoku University	Japan
18.	California Institute of Technology	USA
19.	University Toronto	Canada
20.	Northwestern University	USA
21.	University Wisconsin – Madison	USA
22.	North Carolina State University – Raleigh	USA
23.	University Washington – Seattle	USA
24.	Princeton University	USA
25.	Kyoto University	Japan
26.	Ohio State University - Columbus	USA
27.	Imperial College London	UK
28.	**Swiss Federal Institute of Technology - Lausanne**	**CH**
29.	Tokyo Institute of Technology	Japan
30.	University Florida	USA

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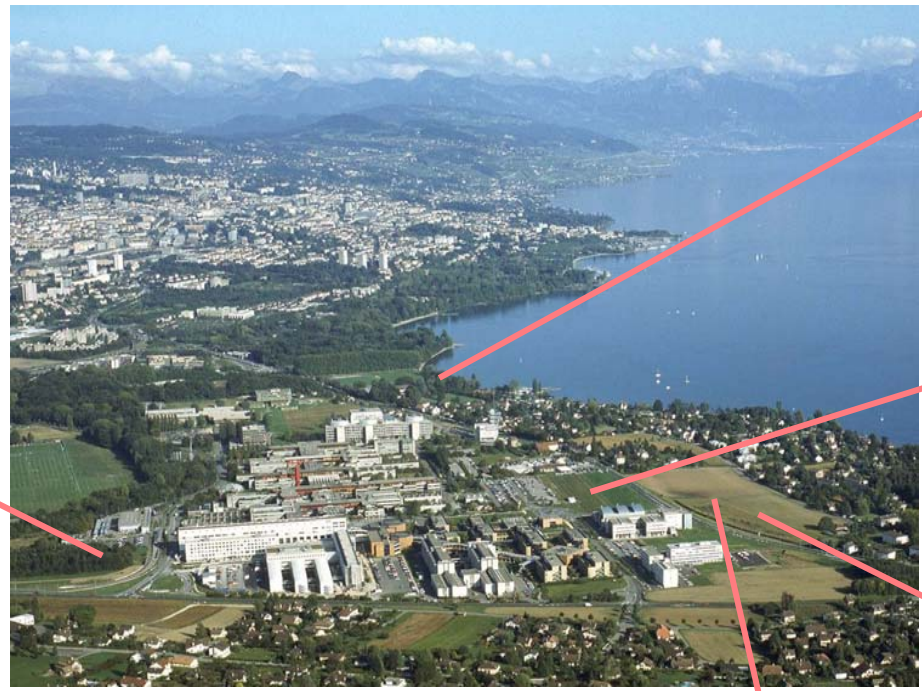
A Campus University by 2010

Sport center



Conference Center

Rolex Learning Center

Student housing

Hotel

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Teaching Computing to Engineers

Course : Computer Aided Engineering

- Encourage thinking before typing
- Introduce themes that are independent of software and hardware characteristics
- Teach science rather than skills and provide information that will remain relevant throughout engineering carriers
- Avoid overlap with courses on numerical simulation

Agility through fundamentals

Theme	Topics
Task definition	• Logic for engineering tasks • Complexity
Representing and using information	• Objects and classes • Data modelling • Search techniques • Decision support systems • Case-based reasoning • Machine learning
Distribution and visualisation	• Geometric modelling and computer graphics • Client-server computing

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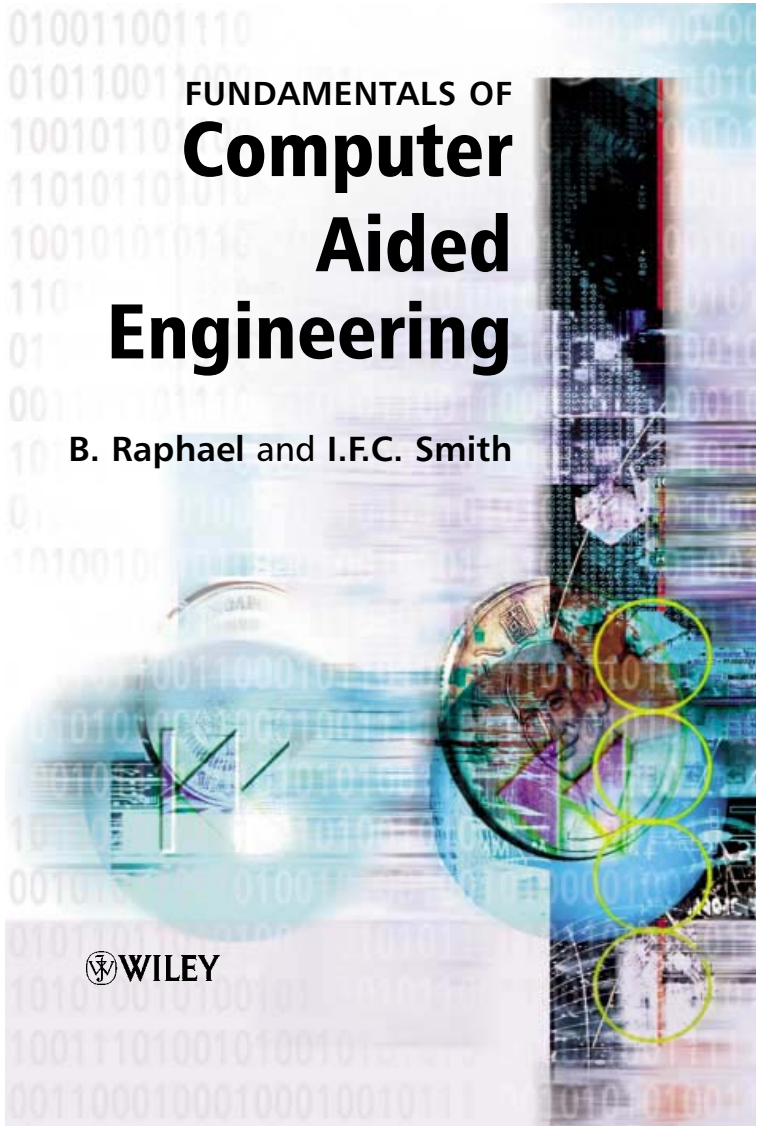

Impact during Engineering Career

- Greater competence to judge new CAE products
- Better teamwork in CAE projects involving computer specialists
- Support for self learning

Remarks

Computers do more for us than just support analysis

Potential for high value added tasks (design, diagnosis, control and collaboration)

Need to have knowledge of the fundamentals of computer science not just computer skills

Knowledge of fundamentals improves agility

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ASCE Collaboration

ASCE Global Center of Excellence in Computing

See → asceGlobalCenter.org

Teaching modules for free down-loading

Currently five available

Ten more to come

All but two of 15 from EPFL