WebValley

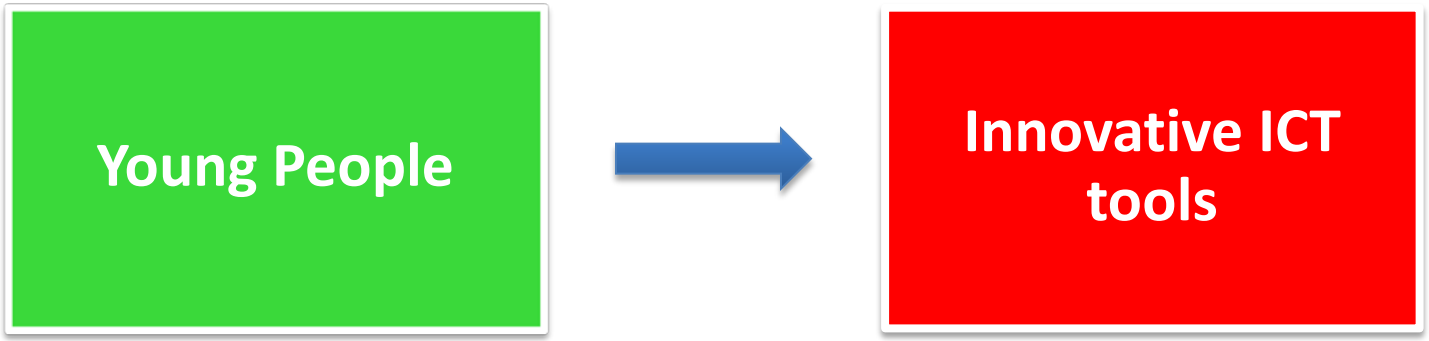
2001-2012

FONDAZIONE BRUNO KESSLER

The WebValley Project

how to involve smart young people
in interdisciplinary science

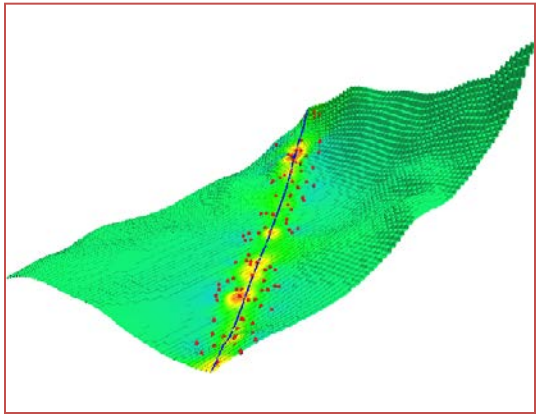
WebValley Concept

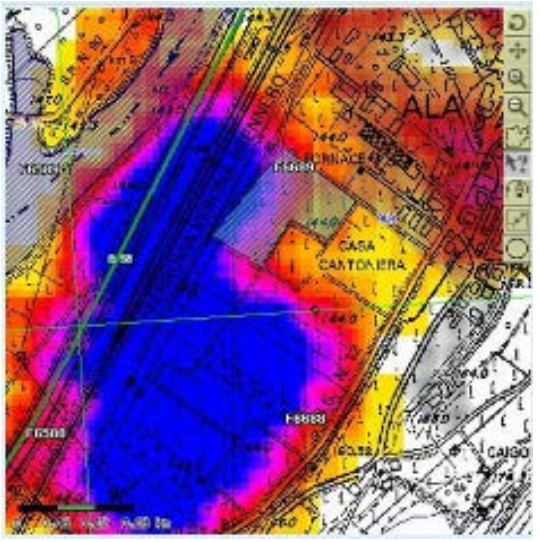


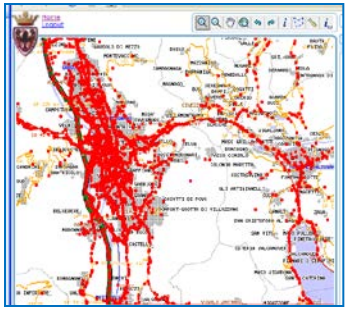
- **WebValley** is the FBK summer school for dissemination of interdisciplinary scientific research
- **The WebValley formula,** since 2001, is to create a team of enthusiast and motivated high school students (18 y) tutored by experienced researchers. The project activities are developed mostly working in groups, in a high-tech lab located in a small Alpine town
- **The team accepts a challenge** by a scientist collaborator from Ecology, Biology or Social Sciences, and **develops in three weeks a new web-based prototype for data analysis and management.**

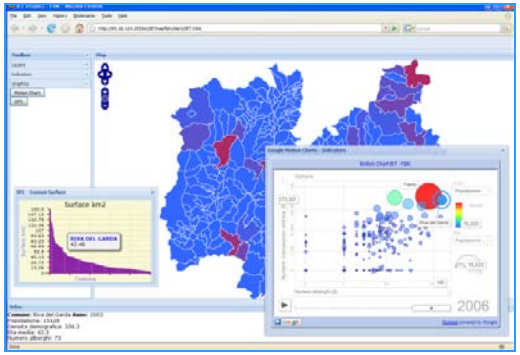
WebGIS on interactive SMART Board: high resolution imageries (Google Earth) are projected to geo-locate facilities and other elements of refugee/IDP camps. Digitalized objects and census data are used by web statistical analysis to highlight sectoral gaps.

WebGIS Tools for Humanitarian Response (with Intersos, 2007)









Young People

Project Vision

BASIC NOTIONS

1. **Encourage smart students to be entrepreneurs in science**
2. Interdisciplinary
3. Transform internet into an innovation building environment
4. Develop team work, collaboration, fast-prototyping attitudes
5. Use sophisticated open source methods in an informal teaching environment
6. Propose challenging themes of ethical interest
7. Use high quality data from scientific or statistical institutions.
8. Learn to use standard formats

But also **learn from young people** how fast they are developing new skills and which is the potential for a new generation of scientists

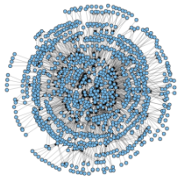
Day 2: Tutorial by E. Giovannini OECD (LusernaLab, 2008)

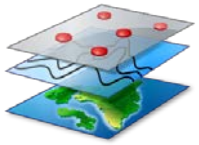
Debate on progress definition with Samaah Abdallah of the New Economics Foundation (Lusernarhof, 2008)

ICT and Science

Science needs models, data services & interfaces

- Reproducibility
- HPC
- Mobile Comp
- Web Infrastructures





The Upscale Challenge: New methods for modeling complex ultra-high throughput data (1 000 000 features, 10 000 samples)

Projects

Since 2001: all about DATA, environment, open source, new interfaces …

Algorithms, scientific computing, databases, GPGPU computing, Web-based prototypes, public presentation.

- **2008: Dynamic graphs** for scientific and public awareness of socio-economic progress indicators (with OECD)
- **2009: Data sonification methods** for identification of trends and novelty patterns in complex time series
- **2010: An open source Web platform for downscaling of climate change indicators** (UNEP, Envirochange)
- **2011: How to communicate change? (MUSE)**
  a Web-Kinect-GIS interface to climate change data

Since 2001: close to 250 alumni

The new colleagues

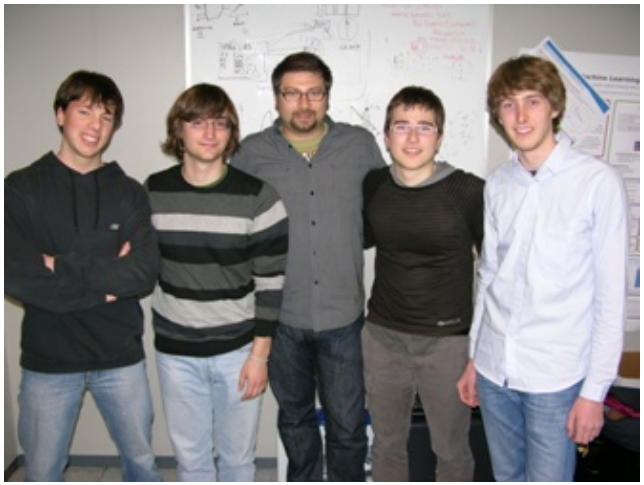
RESEARCH & STUDY: alumni are between 29 and 19 years old today.
Many visited the FBK-IRST campus to:

- Continue working on their WebValley projects
- Develop new projects
- Carry out stage and thesis projects
- Work part time as “Junior Researcher” or “Scientific programmer”, contributing to national and international projects (currently 4 in MPBA)

- **JUNIOR TUTORS**: Each year, 2-3 students from previous editions are recruited as tutors. A former student is now the on-site sysop of the WebValley lab

Connecting to Schools

- **200 alumni , ~ 30 reference teachers**
- **Open without restriction to all high schools in Trentino-AA**



- **WilmaStat:** pluriannual project with Marconi High School Rovereto for data collection tools for statistical survey using mobile devices, a central server and a web interface, funded by Fondaz. Caritro
- **Lichen:** biannual interdisciplinary project with ITG Pozzo (biology, GIS, topography) for bioindicator monitoring funded by Fondaz. Caritro
- **International prize "Junge Forscher gesucht!"**
  - Award 2006: “GIS methods for ecologic accessibility”
  - Award 2010: “A web-based platform for experimental design and time series analysis with GPGPU”
- **2010-2012: “Mobile Scientific Computing”** a project for Ist. Battisti Bolzano, with EURAC Bolzano: an introduction to Scientific Computing with Python and interdisciplinary applications

* Seeking young researchers

The Climate Change Projects

- **2010:** Climate Change! Multi-scale models to combine and compare **global information with local data**
- The result: **GeoscalerHub**:
  - A **WebGIS platform** to compute and visualize local and global **climate change indicators**
  - **Datasets:** Prudence, WorldClim
  - Downscaling algorithms adapted to the Alpine system and validated with real high res. data
- **Technical collaborations:** UNEP, EURAC, ISTAT, spatial-ecology.org

WebValley International 2011
(June 19 – July 09)

The project theme of 2011 developed a **Web-Kinect-GIS interface** to climate change data. Novel ways to interact with maps and complex environmental scenarios, including gesture and use of smartphones will be explored. A concept prototype exhibit will be developed for the new Trento Science museum (designed by Renzo Piano)

Underlying vision: innovation in understanding scientific data; Scientific reproducibility; improve awareness to climate change data, uncertainty and costs of extreme events

In collaboration with: international experts from: Global Biodiversity Information Facility (GBIF), Landcare Research NZ, spatial/ecology.net, Mach Foundation (EnviroChange and gene plasticity projects)

Our Partners

WebValley International 2011: 22 high school students from Italy and the USA, interested in biology, ecology, mathematics, informatics.

From a total of 103 candidates preselected by schools:

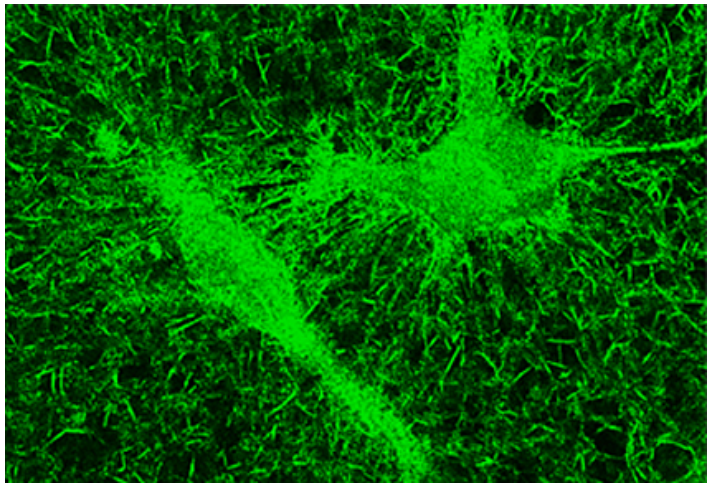
- 11 students from Trentino—AA
- 4 Italian extra-regional students (co-funded by Piano Nazionale Lauree Scientifiche- Mat/Stat areas and Rotary Fermo)
- **6 USA INTEL ISEF Finalists (sponsored by FBK Admin. Board Trust)**
- **1 USA** Philadelphia, North Penn High School, PA, USA

Event sponsored by the Italian Embassy in Wash. D.C. ,
with the endorsement of the UNESCO Venice Office

32 Mb fiber-optics connection (Trentino Network)
3 Smartboards (Edutech & Computer Learning),

WebValley

WebValley International 2012
(June 17 – July 07, Transacqua)



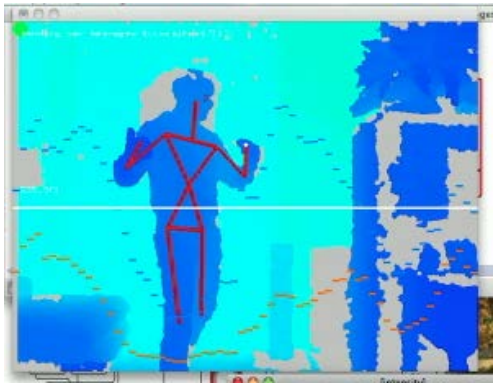
Multi-scale science: the nanoWebGIS interface for molecular medicine data

The project

- a new type of interface to big data in molecular biology.
- Open source **on-line spatial exploration of data, from lab instruments or simulated environments of 2D/3D cellular dynamics**.
- **The project shall enable the sharing between scientists of multi-scale studies, the overlay of models and real data, with an interaction based on Kinect and Android interfaces.**
- **Extend the 2011 tools - add an interaction with Smart WebTV displays to the newest GIS and WebGIS methods.**

With: University of Michigan, Centre for Integrative Biology, Mach Foundation

Requirements



Fellowships will include full tuition, accommodation and travel costs. For the 2012 edition: **18 fellowships are available** for students from:

- 7 Trentino and AltoAdige-SudTirol
- 4 National (co-funding : PLS - National Program for Mathematics and Science Education)
- 7 International (co-funding: FBK Trustees Board)

The **requirements** to participate are:

· High School student (for Italy: 4th year completed)
· Good knowledge of English
· Enthusiasm in science and new technologies
· Above-average school records
· 2 letters: Student Motivation , Teacher's recommendation

WebValley

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On-line applications: Apr 24 - May 21.
Download WebValley2012 Brochure

> Fondazione Bruno Kessler (FBK) is glad to announce the organization of **WebValley 2012 - International in Primiero, Trentino (June 17 - July 7, 2012). On-line applications: Apr 24 - May 21.**

WebValley is the FBK summer school for dissemination of interdisciplinary research: **almost 250 students** (17-18y old) have attended the WebValley camps since its first edition in 2001. WebValley started as a regional initiative for high school students from Trentino Alto-Adige SudTirol, and it is now an opportunity for national and international students to experiment scientific research.

Fellowships will include full tuition, accommodation and travel costs. Thanks to cofounding by collaborating institutions, for the 2012 edition, 18 fellowships are available for students from: **7 Trentino and AltoAdige-SudTirol 4 National** (co-funding PLS - National Program for Mathematics and Science Education) **7 International** (co-funding: FBK Trustees Board)
Find here more info for our Intel ISEF finalists FBK Grant Awards.