Mario Malcangi

13th Academic Conference
Antibes – French
15-18 September, 2014

Università degli Studi di Milano

SmartWeather:

A multidisciplinary project for scientific and technical high schools

Mario Malcangi

Department of Computer Science
Università degli Studi di Milano
Milano, Italy
malcangi@di.unimi.it

Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

Why

- ✓ Instruction is mainly based on learning rather than understanding
- ✓ Absorption short-cuts the natural ability of the teenagers to learn by intuition, observation, and knowledge integration

Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

Why

- ✓ Text reading, lectures listening, step-by-step investigation hides the potential curiosity and intuition capabilities of the students
- ✓ This approach to teach science and technical subjects is not efficient

Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

How

- ✓ Combining disciplines on student's learning is demonstrated to be effective
- ✓ Computational science can lead to meaningful learning and the emerging of the knowledge integration process
- ✓ Technology and its innovative uses is the medium leading to knowledge integration

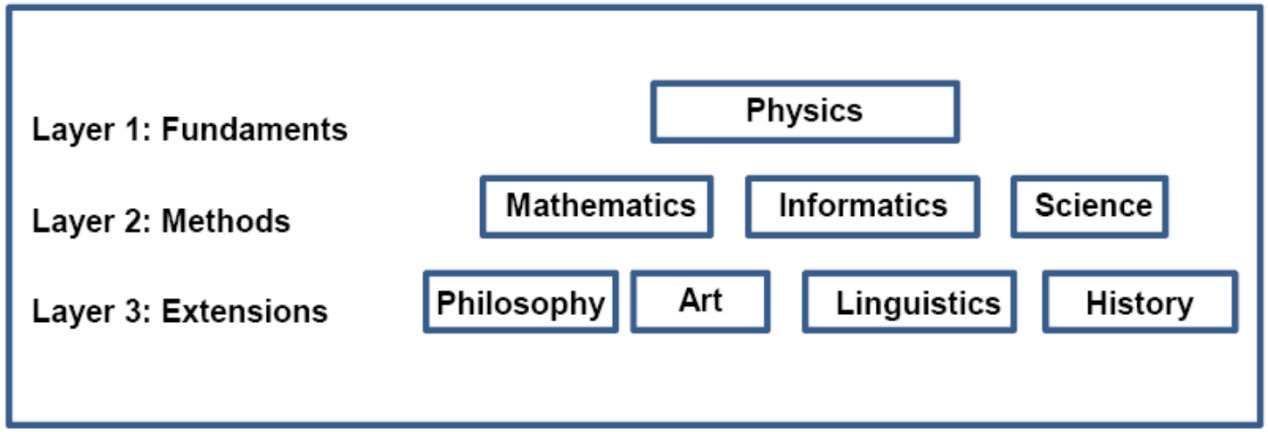
Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

What

- ✓ A three-layer cultural model to lead the students to integrate their knowledge, starting from physical measurements and observations, and applying known methods to execute humanistic and linguistic extensions.



Mario Malcangi

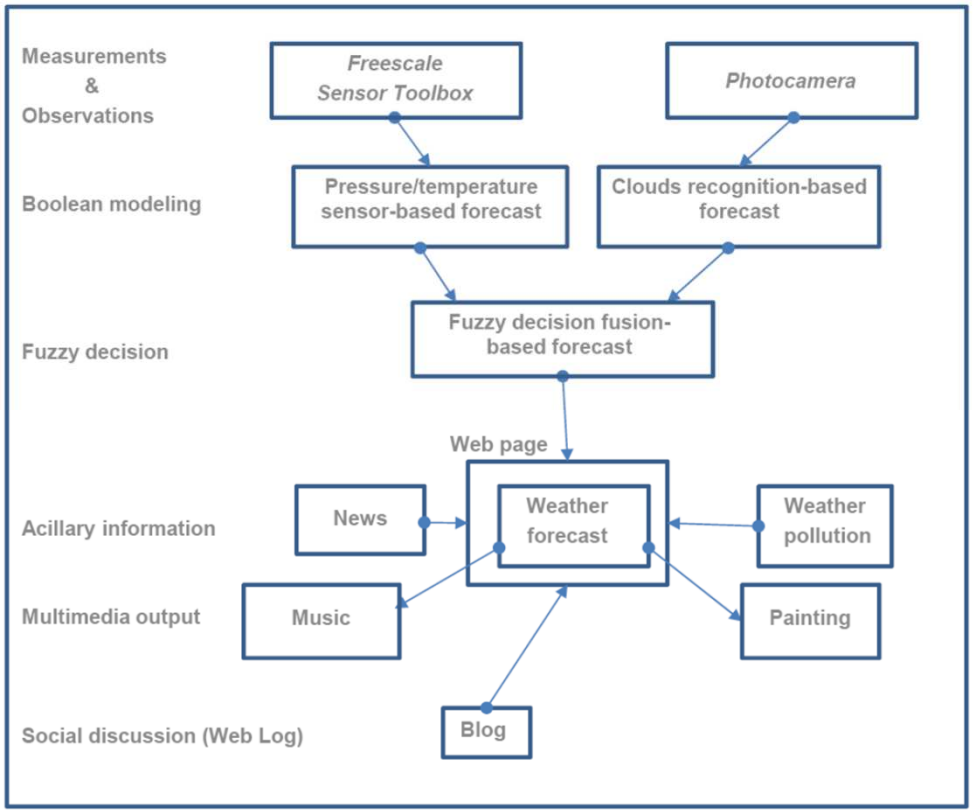
SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

Reference project

- ✓ Weather forecast: multicultural reference project
- ✓ Physics + Mathematic + Informatics = Computational Science
- ✓ More …

SmartWeather



Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Università degli Studi di Milano

Case History

- ✓ Smart Weather project is running in a third-year high school class
- ✓ Two classrooms
- ✓ Topic-oriented groups
- ✓ Four months run
- ✓ Prototype presented to public on May 2014 (UniMI-Under18 initiative of the Università degli Studi di Milano)

Embedded weather forecast station

Prototype of the Smart Weather forecast system with the web page (up left) ,Freescale Semiconductor barometric pressure sensor toolbox(up right) , Freescale Semiconductor APEX sensor board (bottom left), and Freescale Semiconductor MPL3115A2 barometric pressure sensor (bottom right).

Mario Malcangi

Università degli Studi
di Milano

Conclusions

- ✓ Smart Weather is a driver project for scientific and technical high schools
- ✓ Designed to stimulate the integration of the knowledge
- ✓ Based on a three-layer cultural model
- ✓ Computational science approach


Mario Malcangi

Acknowledgments

Thanks are due to:

- ✓ Prof. Irene Poli and Prof. Sara Furcas who have applied this project in their physics laboratory (Liceo Scientifico Maria Ausiliatrice, Milano, Italy)

- ✓ Freescale Semiconductor for technology support: MEMS sensors and related high-level software toolkits

The Smart Weather project is part of the UniMI Under-18, an initiative of Università degli Studi di Milano


Mario Malcangi

SmartWeather: A multidisciplinary project for scientific and technical high schools

Thanks for your attention

UNIVERSITÀ DEGLI STUDI DI MILANO

Mario Malcangi

Università degli Studi di Milano
Department of Computer Science
Via Comelico 39 – 20135 Milano - Italy

Please, address any further question to:

malcangi@di.unimi.it