



PUPIL: Creating applications for the “Smart Classroom”

Overview

The PUPIL framework facilitates the design, development and deployment of **pervasive educational applications**.

A “Smart Classroom” consists of technologically enhanced artifacts, which incorporate situation-aware functionality. Within pervasive environments, user interfaces expand way beyond their static nature and become dynamic components able to react to contextual changes.

In such environments every application can be launched, manipulated and migrated at any intelligent artifact. PUPIL equips designers with a **GUI toolkit** targeted to support the development of user interfaces for “Smart Classroom” applications.

Each of the widgets contained in the toolkit can be appropriately adapted to achieve optimal display on various classroom artifacts maintaining their usability. The collection of widgets incorporates both common basic widgets (e.g., buttons, images) and mini interfaces frequently used in educational applications, as ready-to-use modules.

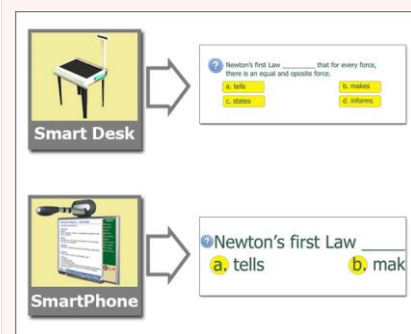
The designer can either (i) combine and customize widgets from both categories (basic widgets and mini interfaces) to build an interface just once, or (ii) build a new interface and incorporate it in the GUI toolkit collection as a custom-made mini interface for future reuse.



The GUI toolkit incorporates both basic widgets and mini-interfaces



Supported devices include laptops, smart desks and interactive boards



Applications are developed only once, as the GUI automatically adapts at runtime to best-fit the targeted device

Target Domains

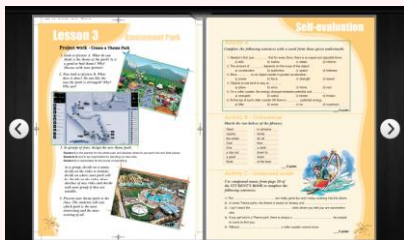
PUPIL targets educational environments consisting of heterogeneous devices. The provided GUI toolkit aims to facilitate the design, development and deployment of pervasive educational applications that can automatically transform, according to the context of use, to ensure their usability. The designers can easily create applications that can be optimally displayed at the student’s desk, student’s laptop or the classroom board. This requires minimum effort on their behalf since only a single interface implementation is needed.

The PUPIL framework currently embeds widgets and mini interfaces mainly targeting the educational domain, however its infrastructure can support the design and development of any adaptable pervasive application.

Description

PUPIL was used to build the following educational applications:

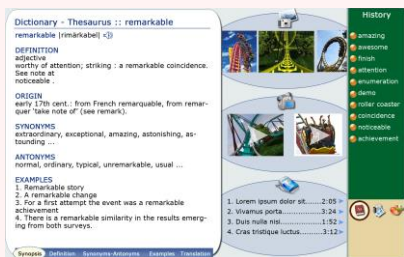
1. The **ClassBook** application electronically augments the pages of a physical book. The images and exercises displayed on any book page can be selected, launching appropriate applications.
2. The **Multimedia** application displays multimedia content relevant to the current context of use (e.g. book image, page, or exercise).
3. The **Dictionary** application displays both textual (e.g., definition, synonyms, etc.) and multimedia information related to a specific word or phrase.
4. The **Multiple-Choice Exercise** application is the electronic representation of a multiple-choice quiz through which a student can select one of the possible answers. A hint button is offered next to each sentence, to help the student find the correct answer.
5. The **Hint** application is launched when the student explicitly asks for help about a specific exercise.



The ClassBook Application



Each picture is supplemented with relative multimedia



The Dictionary application as displayed on a board device



The Multimedia application as displayed on a laptop

Additional Information

Additional information is available through the PUPIL web page.

www.ics.forth.gr/ami/project/pupil/



PUPIL web page

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