

CA5: hybrid world(s)

6700650 / creative application, semester 4, 6 ects

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course description – ca5: hybrid world(s)

The course description(s) are taken from the accreditation report Creative Technology (version 2.0).

content(s) The course is meant as an integrative project, with a special focus on the relation between the real world and the virtual world, not only in a metaphorical sense, but rather as expressed by the notion of the internet of things. Topics addressed include RFID identification, geotagging, and other sensors in combination with online monitoring, logistics. Students are encouraged to design smart systems where (wireless) sensors and feedback control, realized in micromputers play a major role. Such systems could be autonomous robots (e.g. robotics vacuum cleaners and so on), traffic control systems, but could also be partly in the real and partly in the virtual world. Dependent on specialisation and interest students are encouraged to explore issues of smart systems, logistics and traffic management, or playful applications in an urban context. In this context the phrase hybrid may also be understood as multicultural.

Online reference(s):

- www.mediamatic.net/artefact-13370-en.html
- www.mediamatic.net/artefact-33888-en.html

prerequisites Completion of all first year courses, as well as most advanced courses of year two: CS3-4, MA3-5, ST3-5, NM3-5

goal(s) & attainment target(s) The integrative nature of the CA4 project will contribute to find useful and interesting ways to combine smart technology and new media in novel applications.

The course aims at providing

- awareness of privacy and security issues in hybrid applications
- familiarity with developing concepts relating the real to virtual world(s)
- fluency in workflow and project management
- full literacy in applying learned skills to tackle problems in system development

Students are expected to be well-motivated, and will be stimulated in problem-finding and the exploration of creative

place in curriculum: Integrative course at the end second year.

application area & motivating example(s) The internet of things is coming into existence with RFID and GPS as key identification and localization techniques. Advanced process management systems are required that integrate planning, coordination, and control of all logistic business processes and activities in the supply chain network to deliver good consumer value at low cost to the supply chain as a whole while satisfying requirements of other stakeholders in the supply chain. Similar systems although different in character may be used to organize festivals and for playing games in an urban environment, where such technology is available for reasons of security and information.

teaching method(s) The course will offer a selection of topics and projects, from which students may choose on the basis of their interest and specialization. Students will be encouraged to work in small, 4-5 person groups, of an interdisciplinary character, And will be closely supervised in all stages of the product-development life-cycle.

Feedback will be given in workshop sessions, and by assessing the products as made available online. Peer reviews will not only be used for feedback, but will also form part of the procedure of assessment and grading. Grading takes place by assessing the work in a presentation session, where students present and discuss their work and contributions to the group project..

special facilities Contacts with potential industrial or societal partners must be established, to acquire interesting projects with a sufficient degree of relevance and technical interest.

course outline(s) – ca5: hybrid world(s)

In this part a more detailed discussion will be provided of **topics**, **learning goals**, **materials** used, and the actual **structure of the course**, as well as a sketch of the **assignments** given. Also **references** to relevant literature is provided, including **online resources**. At the end, **advice for students** following the course will be given, as well as **hints for the instructor(s)**.

course topic(s)

As a *creative application*, which takes place at the beginning of the second year, the *hybrid world(s)* course has, strictly speaking, no actual course topics, but is rather defined as a collection of **high level requirements**. Topics addressed in the course include:

- sensor-technologies for tracking objects
- logistic(s) – applying sensor-based information in planning
- (smart) display(s) – driven by sensor information
- localization techniques and urban play
- connection(s) – the **internet of things**

And as before, a major principle in *creative application(s)* is **self-organization** and **learning by challenge**, that is finding suitable challenges for achieving the goals set.

learning target(s)

In terms of skills, competences, etcetera, the learning goals of this course can be indicated as follows:

- skill(s) – configuration of sensor systems
- knowledge – sensor data management
- theory – coordination & logistics
- experience(s) – medium scale (playful) logistics application
- attitude – inventive, playful

Again, in accordance with the format of *creative application(s)* **self-management** is essential for the successful completion of the course.

lesson material(s)

The material that will actually be relevant during the course, will to a large extent depend on the actual topics chosen and the **context of application**, that is whether the focus is on **logistic(s) in transport** or **urban game(s)**.

- canonical example(s) – smart technology
- (online) reference material(s) – configuration(s)
- challenging target(s) – game(s)

In this *creative application*, **urban space(s)** will, again, somehow play a role. The challenge here is, while using **serious technology** yet to find (sufficiently) **playful applications** demonstrating the potential of these technologies to, with a reference to *creative application* CA2, improve our **living and working tomorrow**.

course structure

To guarantee continuity and monitor progress we will have a sequence of sessions, as outlined below.

session(s)

1. introduction topic(s) & challenge(s)
2. brain storm(s) – concept development
3. planning – concept & application development

4. technical issues – sensor deployment and data management
5. workflow(s) – configuration(s) and application context
6. theory – communication & logistics
7. societal context of creative application(s)
8. delivery and presentation of final application(s)

Dependent on the size of the group, additional mechanisms of **monitoring progress** may be needed, including logs, periodic accounts, and regular feedback or possibly even **shout-out sessions**.

assignment(s)

With the actual format depending on the application context, we can indicate as a minimal set of deliverables and presentations the items collected in the list below:

assignment(s)

- concept pitch presentation(s)
- planning - approach, realization, deployment
- report(s) – application development and installation
- evaluation(s) – summary of experience(s) and deployment result(s)

To guarantee that progress can be monitored and that results can be evaluated, the group(s) must **maintain a website** with all relevant information available in a sufficiently accessible way.

reference(s)

The main reference for this course consists of a treatise on **convivial design**, which is generally opposed to **industrial design**, since it presupposes a **process of co-creativity** instead of a top-down **design-driven process**.

1. Convivial Urban Spaces: Creating Effective Public Spaces, by Henry Shaftoe
2. A. Eliëns, topical media & game development – media.eliens.net

A wealth of material and references can be found at my **topical media & game development** site, including tutorials and examples.

online resource(s)

As online resources, we suffice with a brief list of references to technology.

- map(s) – **twente** / example(s)
- phidget(s) – product(s)
- vision(s) – opencv.willowgarage.com/wiki
- integration – www.softintegration.com
- processing – www.openframeworks.cc

The students are encouraged to find additional information and links.

advice for the student(s)

Eventhough the focus of this course seems to be primarily on **smart technology**, there is a strong need for (equally smart) **new media** applications, not only to give **visual expression** to the mechanisms underlying the logistics of the application, be it in **transport or play**, for example using **maps** and other **interactive visualization** techniques, but also to provide adequate **means of interaction** to control **operational aspects** of the **system or game**. In other words, use your **imagination** and **technical skills**!

hint(s) for the instructor(s)

Independent of whether the focus of the course will be a serious topic such as **transport of goods** or a more playful one like **urban play**, it seems worthwhile to involve representatives of the regional **creative industry**, not only to find a wider **context of deployment** and opportunities for **collaboration**, but also to facilitate the eventual promotion of the outcomes of the course in a commercial **product or service**, from which both the students and the **creative technology** curriculum will benefit.

afterthought(s)