

“Ambient Media and Beyond” TUTORIAL

Dr. Artur Lugmayr

lartur@acm.org, Tel. +358 40 821 0558, www.lugy.org



Company

LugyMedia – creating entertainment experiences – www.lugy-media.tv –
artur.lugmayr@lugy-media.tv



University

NAMU - The NEW ambient multimedia research group – www.cs.tut.fi/sqn/namu -
artur.lugmayr@tut.fi

Objectives and Content

Media evolved from media that can be described as integrated presentation in one form (multimedia). From multimedia, media evolved towards embedding the consumer in a computer graphic generated synthetic world (virtual reality). From this point on, media evolved to the consumers directly exposed to the media in their natural environment, rather than computer interfaces (ambient media). In addition, media will be evolving towards a fully real/synthetic world undistinguishable from pure media integrating human capacity (biomedia or bio-multimedia) somewhere in the very far distant future.

This course is based on the following book:

- **A. Lugmayr, Ambient Media and Beyond: Springer-Verlag NY, to be published 2007 [3]**

The goal is to train and educate participants in new innovative service design for ambient multimedia. The course will cover potential and possibilities of this new multimedia field and its relation to other trends, such as ubicom, pervasive computation, affective computation, and tangible media. Specific key-concepts of ambient media are developed based on various business case studies.

The ‘ambient way of thinking’ in media technology enriches the world of media by the following principles:

- automation – media are aggregated smartly by systems;
- natural interaction – humans interact intuitively and naturally;
- proactive – systems know human desires and act on their behalf;
- emotional – systems recognize and express human emotions;
- transparency – transparent and augmented access to content;

- ubiquitous/pervasive – *hardware and software disappear;*
- beyond push/pull – *systems aggregate content, rather than humans*

The course will give a comprehensive overview of the key ideas behind ambient intelligence, business and consumer trends, underlying technology, and new forms of potentially emerging media types.

Target Audience

This course is designed for a general audience, which is interested in the future of media technology. It will review business aspects, service models, and the underlying technology.

Timetable

1 Day Tutorial 9:00-16:00		
09:00-10:30	Introduction	
		<ul style="list-style-type: none"> • <i>Introduction of participants</i> • <i>Ambient intelligence – what is it?</i> • <i>History</i> • <i>State-of-the-art</i> • <i>Organizations and entities</i> • <i>General viewpoints</i> • <i>Business viewpoint</i> • <i>Consumer and social implications</i> • <i>First practical examples & use-cases</i>
11:00-12:30	Concepts overview	<i>Basic concepts and technology of ambient media and introduction of the key-concepts.</i>
		<ul style="list-style-type: none"> • <i>Introduction of the components of Aml</i> • <i>Hardware components (ambience)</i> <ul style="list-style-type: none"> ○ <i>Smart materials</i> ○ <i>MEMS & sensor technology</i>

		<ul style="list-style-type: none"> ○ <i>Ubiquitous communication</i> ○ <i>Adaptive software</i> ○ <i>Embedded devices</i> ○ <i>I/O device technology</i> • <i>Software components (intelligence)</i> <ul style="list-style-type: none"> ○ <i>Media management & handling</i> ○ <i>Emotional computation</i> ○ <i>Natural interaction</i> ○ <i>Context awareness</i> ○ <i>Computational intelligence</i> ○ <i>Presence technologies</i>
12:30-13:00	Lunch break	
13:00-14:30	Contributing Trends	<i>Existing trends in computation contributing to the vision of ambient media.</i>
		<ul style="list-style-type: none"> • <i>Ubiquitous computation</i> • <i>Affective computation</i> • <i>Sensible media</i> • <i>Tangible media</i> • <i>Calm computation</i> • <i>Appliance computation</i> • <i>Pervasive computation</i> • <i>Life-style computation</i> • <i>Slow technology</i> • <i>Amplified reality</i>
15:00-16:30	Ambient Media	What is new in ambient media?

		<ul style="list-style-type: none"> • <i>Ambient <u>media</u> as such</i> • <i>Ambient space</i> • <i>Content aggregation rather than pull/push</i> • <i>Modelling the human and its capabilities</i> • <i>Collaborative ambient media</i> <ul style="list-style-type: none"> ○ <i>New forms of interaction</i> ○ <i>User-created content</i> ○ <i>M2M collaboration</i> • <i>Assets rather than content or products</i> • <i>Metadata based sensor networks</i> • <i>Consumer behaviour oriented services</i> • <i>Case-Studies</i> <ul style="list-style-type: none"> ○ <i>Smart home living environments</i> ○ <i>Ambient narratives</i> ○ <i>Collaborative ambient content</i> ○ <i>Context awareness</i>
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Materials

- *Printed slide-sets in a tutorial form;*
- *A. Lugmayr, "Ambient Media and Beyond", Springer-Verlag, 2007 (to be published) – selected printout of book chapters;*
- *Other relevant materials (e.g. publications)*

Equipment

- *only laptop connection and data projector*
- *Internet connection*

Detailed Content of the Course

Introduction

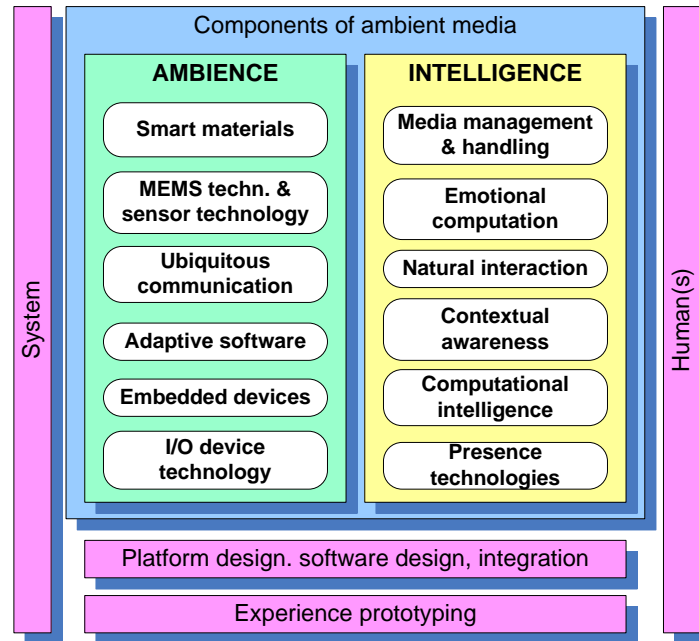
The introduction part of the course will explain on an overview basis what actually ambient intelligence is. In the introduction the history is presented, the state-of-the-art reviewed, and important organizations and entities are identified. The introduction part of the course will make the audience understand what ambient intelligence is. The introduction part also focuses on the business viewpoint, gives social and human implications in a changing media environment, and rounds up with selected use-cases and practical examples of ambient media in action.

Besides, the introduction will review:

- Introduces the world of media, its forms, basic principles, historical aspects, and mechanisms. It also introduces ambient media as a novel media type;
- Tech hypes and their impact on ambient media” focuses on existing trends and hypes in technology and discusses their impact on ambient media;
- General developments in the world of multimedia, business viewpoints, social implications, reviews, trends, and basic theories. It presents the societal and political viewpoints and evaluates what is currently available and which novelties are to be expected. By examples, historical aspects are reviewed that should lead to a higher way of thinking about ambient media;
- Gives general viewpoints towards Ambient Media, reviews scientific fields involved in Ambient Media, presents the transitions in switching towards ambient media, presents the transitions in society and consumer behaviour, transition in technology, ambient content, transitions throughout the value chain, shows the difference between ambient media and other media, and identifies basic requirements.

Concepts Overview

The two essential components, ‘ambience’ and ‘intelligence’, and their sub-components for ambient information systems according to ISTAG. The component ‘ambience’ deals with hardware technology as part of the natural environment of the consumer. This also includes objects in the natural environment of the consumer. The component ‘intelligence’ refers to the soft-components of ambient systems, e.g. machine intelligence or media management. ISTAG also includes platform design issues, software development, engineering, and experience prototyping as belonging to ambient information systems [1, 2, 4]. This part of the lecture includes a comprehensive overview of: ambience (hardware), and intelligence (software).



1) Ambience (hardware):

- a) *Smart Materials*
- b) *MEMS and Sensor Technology*
- c) *Embedded Systems Technology*
- d) *Ubiquitous computation*
- e) *I/O Device Technology*
- f) *Adaptive Software*

2) Intelligence (software):

- a) *Media Management and handling*
- b) *Natural Interaction*
- c) *Computational Intelligence*
- d) *Contextual Awareness*
- e) *Emotional Computing*

Contributing Trends: Ubicom, Affective Computation, and all the others

The section of the course presents the technological trends (e.g. sensible media, tangible media, calm computation, and ubiquitous computation, multimedia, virtual reality, amplified reality and slow technology, affective computation, appliance computation, pervasive computation, life style computation)

of the previous decades between hype and their maturity. The key trends having impact on ambient media are shown.

Ambient Media

Introduction of the key-concepts of ambient media in relation to existing computational trends. These especially include:

- Ambient media as such
- Ambient space
- Content aggregation rather than pull/push
- Collaborative ambient media
 - New forms of interaction
 - User-created content
 - M2M collaboration
- Assets rather than content or products
- Use-cases and scenarios
- Media Aggregation, Rather than Pull & Push Schemes
- Ambient Media' as Media Form
 - Units of Ambient Media, Manifestation, Morphing, Intelligence, Models for Context Awareness
- Etc.

Trainer Short-Bio

Dr. Artur Lugmayr describes himself as a creative thinker and his scientific work is situated between art and science. His vision can be expressed as to create media experiences on future emerging media technology platforms. He is pursuing his second doctorate at the School of Motion Picture, TV and Production Design in Helsinki, Finland. He is the head and founder of the New Ambient MULTimedia



(NAMU) research group at the Tampere University of Technology (Finland) which is part of the Finnish Academy Centre of Excellence of Signal Processing from 2006 to 2011. The research group focuses on the development of smart spaces for media. He is currently preparing his second, individually authored, text-book entitled "Ambient Media and Beyond" with Springer-Verlag in 2006. He chaired the ISO/IEC ad-hoc group "MPEG-21 in broadcasting"; won the NOKIA Award of 2003 with the text book "Digital interactive TV and Metadata" published by Springer-Verlag in

2004; country representative of the Swan Lake Moving Image & Music Award; project proposal reviewer; invited key-note speaker for conferences; workshop organizer for conferences; reviewer for publications and book chapters; has contributed one book chapter and written over 25 scientific publications. He gained his scientific practical experience in Austria (University Linz, RISC), Finland (Tampere University of Technology, School of Motion Picture, TV, and Production Design) and Greece, where he participated in several research projects. He is the inventor of bio-multimedia - integrated human capacity and the MPEG-21 based Digital Broadcast Item Model (DBIM). His passion in private life is to be a notorious digital filmmaker. More about him at <http://www.lugy.org> and on <http://www.cs.tut.fi/sgn/namu>.

References

- [1] ISTAG, "Scenarios for Ambient Intelligence in 2010 - Final Report (Feb. 2001)," 2001, <http://www.cordis.lu/ist/istag.htm>
- [2] ISTAG, "Ambient Intelligence: From Vision to Reality," European Union: IST Advisory Group, draft report 2003.
- [3] A. Lugmayr, Ambient Media and Beyond: Springer-Verlag NY, to be published 2007.
- [4] A. Lugmayr, A. Pohl, M. Mühlhäuser, J. Kallenbach, and K. Chorianopoulos, "Ambient Media and Home Entertainment," in Interactive Digital Television: Technologies and Applications, G. Lekakos, K. Chorianopoulos, and G. Doukidis, Eds.: Idea Group Publishing, 2007.