Learning at your Leisure: Modelling Mobile Collaborative Learners

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■ NTNU

Outline

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Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application

Background and Motivation

- Learning is most effective when done in a social and takes place in a relevant context.
- Providing continual access to context dependent learning resources is required.
- Ambient intelligent systems provides such facilities, by proactively adapting to their users' needs.
- Ambient intelligent systems that has a homogeneous group of users can rely on canonical and/or implicit user models
- Whereas, systems with non-persisten and/or heterogeneous user groups specific user models are likely to be preferred.
- We suggest the use of stereotype as the method of choice for constructing user models.

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Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application
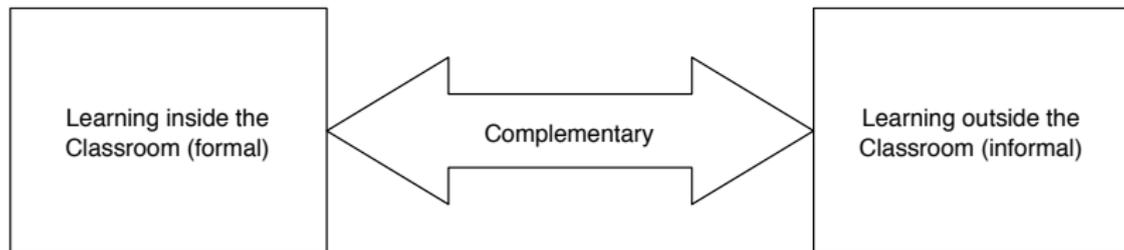
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Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application
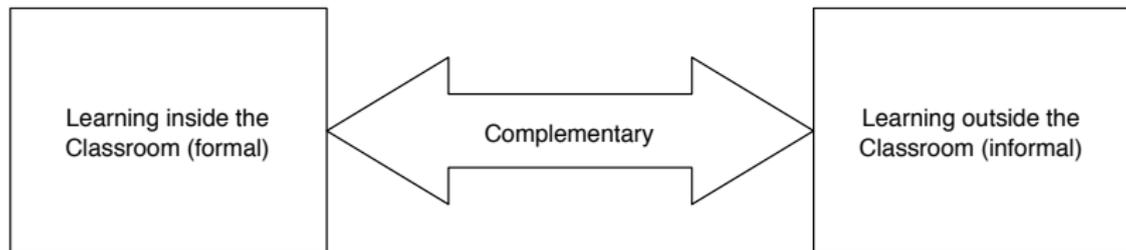
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Modelling Collaborative Learners
Summary and Future Work

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Ambient Intelligence
Existing Application

Mobile Collaborative Learner

Learning inside the Classroom (formal) — Complementary → Learning outside the Classroom (informal)

- Learning in general, and language learning in particular, needs to complement formal classroom learning with experiences outside the classroom (informal).
- We assume a socio-constructivist perspective on learning.
- A learner that is mobile and collaborates with his peers is a mobile collaborative learner.

Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application
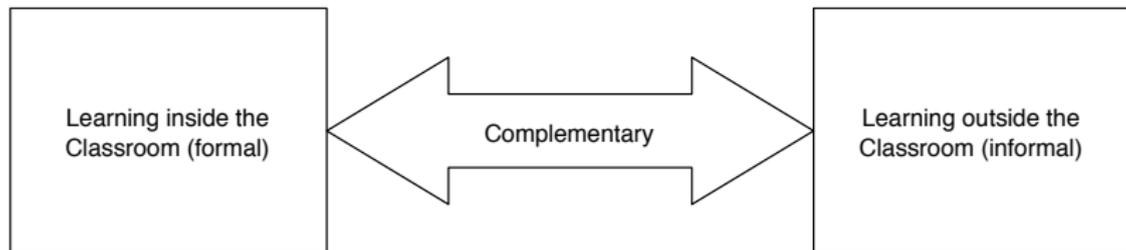
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Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application
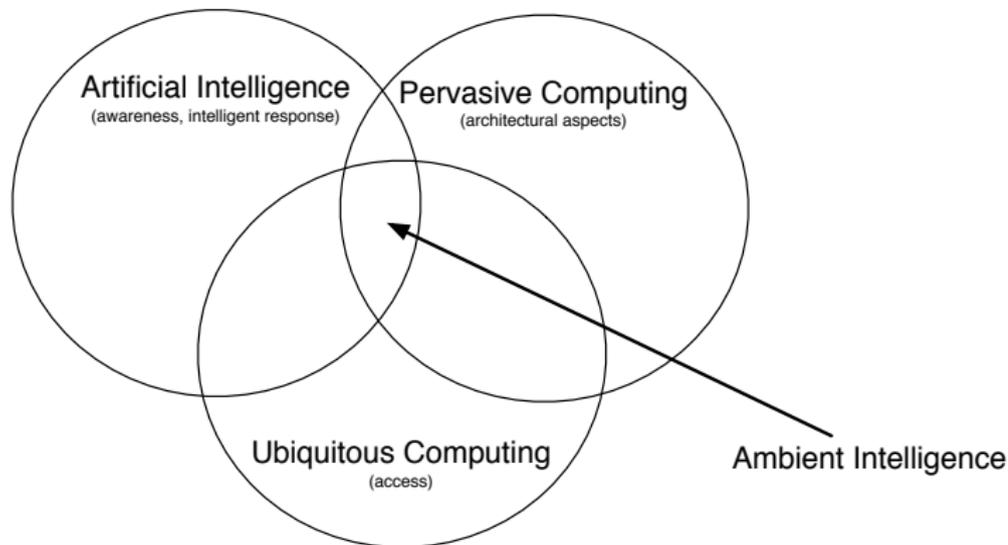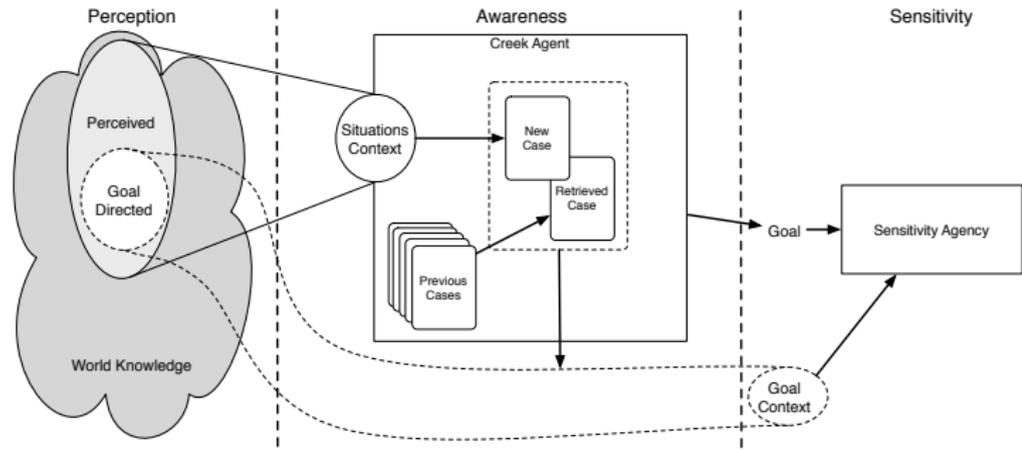
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Modelling Collaborative Learners
Summary and Future Work

Background and Overview
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Ambient Intelligence
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Ambient Intelligence

Artificial Intelligence
(awareness, intelligent response)

Pervasive Computing
(architectural aspects)

Ubiquitous Computing
(access)

Ambient Intelligence
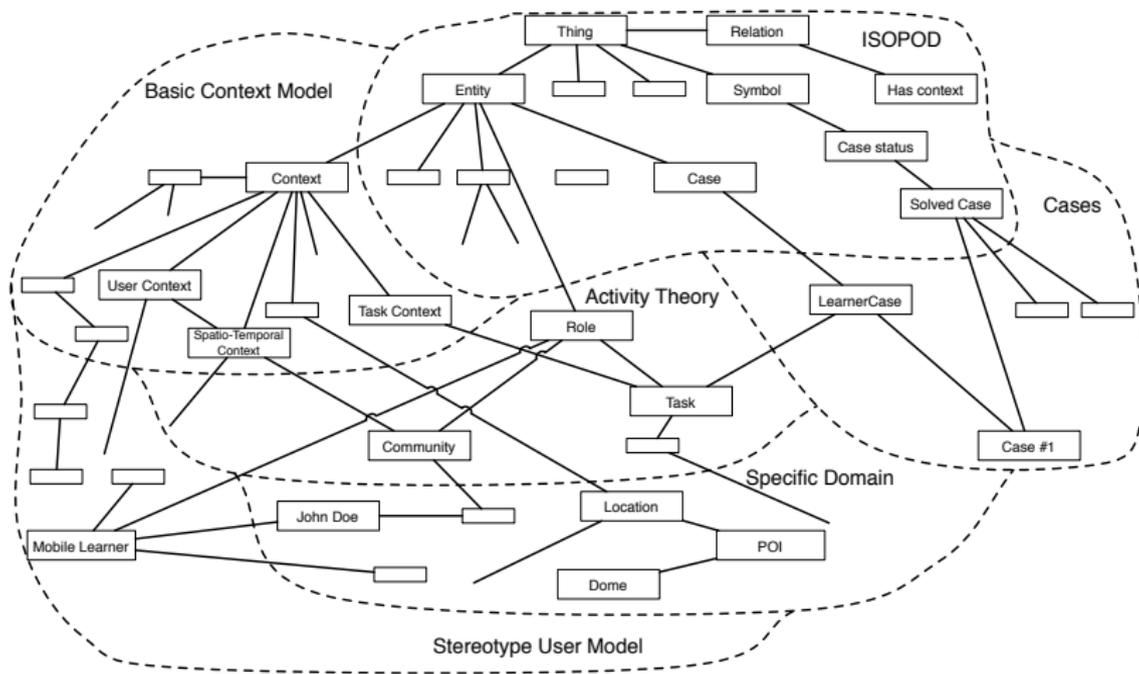
- Ambient intelligence can be seen as an intersection between ubiquitous computing, pervasive computing and artificial intelligence.

Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Background and Overview
Mobile Collaborative Learner
Ambient Intelligence
Existing Application

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Background and Motivation
Modelling Collaborative Learners
Summary and Future Work

Learner Modelling
Using Stereotypes
An Example

Learner Modelling

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Modelling Collaborative Learners
Summary and Future Work

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Using Stereotypes

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                    ┌─────────────┐
                    │ Any-person  │
                    └─────────────┘
        ┌──────────────┬──────────┬─────────────┐
   ┌─────────┐   ┌──────────┐        ┌─────────┐
   │ Student │   │ Domestic │        │ Foreign │
   └─────────┘   └──────────┘        └─────────┘
     ┌────────┐                    ┌──────────┐
┌──────────┐  ┌──────┐            ┌────────┐
│ Natural  │  │ Arts │            │ German │
│ sciences │  └──────┘            └────────┘
└──────────┘
  ┌─────────┐  ┌─────────────┐
┌─────────┐  ┌─────────────┐
│ Physics │  │ Mathematics │
└─────────┘  └─────────────┘
```

- Each stereotype contains a set of triplets:
  <facet, value, rating>

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Summary and Future Work

Learner Modelling
Using Stereotypes
An Example

An Example

- A new learner fills in a questionnaire
- The learner is assigned "correct" stereotypes
- The system can now construct a sequence of tasks for the learner:
  1. Select suitable sequence of tasks for the user model
  2. Construct sequence of actions based on the stereotype modelling
  3. Populated the sequence of actions through activation of a virtual enterprise
  4. Ask the user to verify the plan. Return to 1 until the user is satisfied

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Summary and Future Work

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Summary and Future Work

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Summary and Future Work

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- We have outlined the use of stereotypes for user modelling in Ambient Intelligent systems with heterogeneous users
- We wish to supplement our use of activity theory with pedagogical domain knowledge
- The assignment of facets and values to the services is as of yet unexplored
- We are currently developing the extension to our existing code-base

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