<table>
<thead>
<tr>
<th>When (Aud. 3)</th>
<th>What</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 - 13:20</td>
<td>Introduction to GSD</td>
<td>Claus</td>
</tr>
<tr>
<td>13:40 - 14:00</td>
<td>Audio/Video Tools</td>
<td>Yoo</td>
</tr>
<tr>
<td>14:00 - 14:15</td>
<td>--- pause ---</td>
<td>---</td>
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<tr>
<td>14:15 - 14:20</td>
<td>Revelation of Groups</td>
<td>Claus</td>
</tr>
<tr>
<td>14:20 - 15:00</td>
<td>Group Exercise</td>
<td>Student Groups</td>
</tr>
<tr>
<td>15:00 - 15:15</td>
<td>--- pause ---</td>
<td>---</td>
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<tr>
<td>15:15 - 16:00</td>
<td>Presentation of Projects</td>
<td>Supervisors</td>
</tr>
<tr>
<td>16:00</td>
<td>Q'n'A</td>
<td>---</td>
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</tbody>
</table>
GSD History

Previous years:
- 3 years - projects with PKU/China
- 15 students/3 teams

GSD 2011:
- 45 students /9 teams
- China, Kenya, Brazil
- Prerequisite course on collaboration
Global Groups

IT University of Copenhagen
Copenhagen, Denmark

Universidade Federal de Pernambuco
Recife, Brazil

1: Claus Brabrand
   (brabrand@itu.dk)
   Associate Professor, Ph.D.
   (Programming, Logic, and Semantics)
   IT University of Copenhagen

2: Paulo Borba
   (phmb@cin.ufpe.br)
   Full Professor, Ph.D.
   (Software Productivity Group)
   Uni. Federal de Pernambuco
Global Collaboration

Global collaboration across...:

- Continents (South America)
- Distance (8,300 km)
- Time zones (4h summer, 5h winter)
- Language (Portuguese)
- Culture (Brazilian)
- Collaboration norms
- Educational traditions and structure
Distance + Time Diff  =>  IT

Technological challenges:
- Requires fast internet connection
- Good video conferencing facilities
- Collaboration Tools

Communication challenges:
- Language competences
- Communication competences
- Collaboration competences
- Coordination competences

Help:
- Rosalba & Yoo
- Dist Comm Course
- Supervisor(s)
Culture & Educational Traditions

- **Culture:**
  - E.g. a Danish deadline vs. a Brazilian "deadline"

- **Educational Traditions:**
  - Fx.: Authority of the teacher:
    - (exaggerated)
Educational Structure

ITU:

- Bachelor (3 years)
- Master (2 years)

COURSE

1
2
3
4
5

Long summer vacation (Jun/Jul/Aug) and short winter vacation (Dec/Jan)

UFPE:

- Bachelor (4 years)
- Master (2 years)

COURSE

1
2
3
4
5
6

Short "winter" vacation (Jul/Aug) and long summer vacation (Dec/Jan/Feb)

Calendar:

- Feb: 15/2
- Mar: 28/2
- Apr: EASTER
- May: 25/5
- Jun: 15/6
- Jul: ca 30/6, ca 15/7
Project: Smash-Up Robots

GSD 2012:
Denmark-Brazil
SMS-Based Web Robots

Phone Users

Programmable SMASH Robots

SMS Gateway
(#, film)
Service Registry
↔
SMASH Server
(#, reply)

SMS Gateway
(#, ,tv2)

IT University of Copenhagen

IMDb

TV Guide

CNN

Phone

users phone users

Matrix 21:15
[*****]

Matrix 21:15
[*****]

today? 20-24
rating? Matrix
8.6/10

<brasil/>

Web Services

films?

Matrix 21:15
[*****]
SMS-Based Web Robots

Phone Users

Programmable SMASH Robots

Web Services
Communication (DK <-> BR)

SMS-HTTP Gateway:

- SMS Gateway:
  - Number
  - Message

- SMS-HTTP GW:
  - ITU

- Web Server:
  - ITU

- SMS-HTTP Gateway:
  - (number, message)
Example Smash-Up Services

- Return the essential information from a given Web page
  - E.g. Champions League results:

- Broadcast message to 5 people; 3 via SMS (during day) and 2 via email:
  - E.g. Family infocast

- Arrange soccer game Sunday nights ("game is on" if there are at least 8 players):
  - Coordinate players (Y/N) + broadcast match status:

- Monitor a Web pages and send a message when some situation arises:
  - E.g. When stock X is cheaper than stock Y
The goal of this project is to **design, develop,** and **deploy** WEB SERVICE ROBOTS ("programmable personal assistant(s)") that function on top of the internet as it is.

The idea is that such programmable robots could then assist people in their everyday lives by *automatically* surfing web pages and web services, *automatically* extracting and submitting information, and *automatically* managing and coordinating various tasks. We expect that a lot of tasks could be automated and a lot of coordination taken care of by such services. Additionally, a lot of completely new things become possible.

The robots will interact with people *via SMS* which means that they will work for **everyone, everywhere, all the time**; even in developing countries where many people do not have access to the web, but often still have a cell phone!

This project will happen in collaboration with students from **UFPE** (Universidade Federal de Pernambuco) in **Recife, Brazil**. We hope that the services developed could later be deployed in Brazil. Such robots should be able to make a substantial difference for people there.

**Keywords:** Web-Data Extraction (web scraping), Automated Browsing, Web Services, Web 2.0, XML, Communication, Orchestration, Cell Phones, SMS.
### Related Work Survey:
- Collection of existing SMS-Based Services
- => Turn these into a **Taxonomy**
- => Describe / Explain / Reflect
Intended Learning Outcomes

**Increased Learning Outcomes** (research inspired)
(i.e., exactly the same on the Brazilian side!)

**PRODUCT (70%):**
- Design a couple of actual smash-up services; 25%
- Implement the designed services; 25%
- Evaluate the designed services; 10%
- Relate to existing solutions, frameworks, and services; 10%

**PROCESS (30%):**
- Develop and maintain a plan for the collaboration; *and* 15%
- Reflect continually on the plan and the actual collaboration. 15%
Relevant Aspects

- **SMS-HTTP Gateway** [using Kannel]:
  - switch between (live use) real phone vs. (development use) mockup client

- **Web Data-Extraction** (scraping) [Selenium 2.0, Firefox]:
  - Xpath, regexps, robustness/stability?, full browser?

- **Service-User management?**:
  - phone book, services registered, directory?, subscription?, ...

- **Easy Service deployment**:
  - easy to add new services: infrastructure + easily plug in a service (API / subclass)

- **Communication/interaction patterns**:
  - tell, ask, reply, correlation?, ...

- **Events?**:
  - proactive (timeout), reactive (initiation), ...

- **Context** (esp. Locationing):
  - (x,y)-coordinates non-intrusively via Facebook Places or use BlueTooth positioning (triangulate from nearest BlueTooth spots)
Different kinds of Services

- **Domain:**
  - Private vs Public vs Company

- **#Users:**
  - 1-1 RPC vs N-N coordination/orchestration

- **User profiles:**
  - Mobile primary vs mobile only (Brazilian favelas)

- **Service initiative:**
  - Proactive (soccer arrange) vs Reactive (film service)

- Taxonomy of services:
  - good for comparing services
  - good for developing framework/language/API
  - good for learning about such services
Communication Patterns

Proactive (ask):

\[\text{initiate} \rightarrow \text{question}
\quad \text{"think"} \rightarrow \text{answer}\]

\[\text{WSDL: "solicit-response"}\]

Proactive (tell):

\[\text{initiate} \rightarrow \text{continue} \rightarrow \text{react}\]

\[\text{WSDL: "notification"}\]

Reactive:

\[\text{question} \rightarrow \text{answer} \rightarrow \text{continue}\]

\[\text{WSDL: "request-reply"}\]

Reactive (react):

\[\text{initiate} \rightarrow \text{react}\]

\[\text{WSDL: "one-way"}\]

Note: We would like (hi-level) "ask", but we only have (low-level) "tell" + "react" so we have to CORRELATE tell+react in order to seaminglessly provide "ask".
Administrational Stuff

- This is a project cluster (no lectures)
- Group work – manage your own time
- 15 ECTS – partner students may have less time
- Group reports + product
- Individual oral exams based on project report
- Exams do not involve partner groups

- Project base: A project agreement must be sent to the ITU Board of Studies no later than 2 weeks after the start of the project period (i.e., soon!)
Enjoy the Course!
Student Comments

Challenges:

- "The most challenging was to make sure that we both understood the project in the same way."
- "The time difference could be a bit challenging."

Lessons Learned:

- "I have learned that you have to be explicit about everything you negotiate on skype, e-mail, etc."
- "I have learned that it is important that you establish some sort of relationship with the other part, other than just the business-related".

Video:

- (http://global.wikit.itu.dk/Knowledge+Sharing)
Group Exercise

Choose a **time-keeper** and for each discussion point (cf. below); **write down** what you talk about and agree on:

- **Group members:** who are you? Name, background, study profile, etc.
- **Contact information:** exchange phone, e-mail, Skype, etc.
- **Meeting time:** Next meeting and weekly meeting times?
- **Roles:** within the Danish group - who has which competences?
- **Time plan:** what is the initial time plan for the project considering your assignment and the information you have about your partner students semester structure?
- **Collaboration management:** How do you plan to manage the collaboration within your group and with your global partners? (e.g. write a collaboration plan?)
- **Conflict resolution ITU group:** For the ITU group – write a list of work-norms and a list of social norms. How do you plan to sanction group members not following the norms? How do you plan to deal with conflicts internally in the ITU group?
- **Conflict resolution global team:** Write a list of possible types of conflicts you can imagine to have in the global team – as well as initial thought on handling such conflicts
- **The project:** The project you are assigned to - what are your initial thoughts and ideas?

**Note:** that you can not decide on things involving your partner group before you have spoken to them (e.g. choice of collaboration platform etc.)