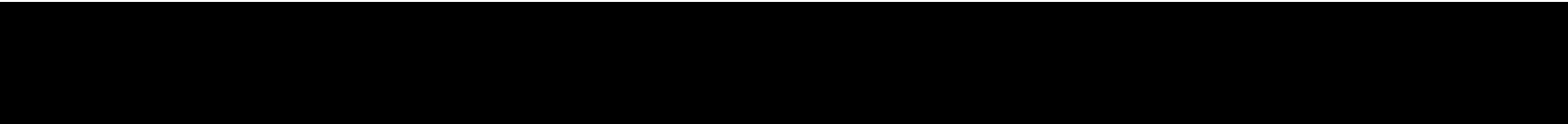



Interaction design in Scandinavia

Lone Malmberg - IT University of Copenhagen





Designing digital technologies in an airport –
privacy aspects

(Break)

From HCI to Interaction Design

Digital Media and Design program at
IT University of Copenhagen

Lone Malmberg

Literature / language + Computer Science

PhD + associate professor at CBS

Malmö University (Sweden) / K3 (Arts & Communication)

Heading Interaction Design (bachelor program)

Heading Creative Environments (research group)

IT University of Cph: InC, <http://www.itu.dk/research/inc/>

SPOPOS, www.spopos.dk

Senior interaction

Interaction design

Digital Media and Design

DesignLab

Editor of [Digital Creativity](http://www.tandf.co.uk/journals/9780203085465) since 1998



Location-Based Services and Privacy in Airports



John Paulin Hansen
Lone Malmborg
Alexandre Alapetite
Henning B. Andersen
Jacob Thommesen

WWW.SPOPOS.COM

Introduction

Mobil phones with location facilities -> privacy concerns

Airport use location technology to predict queues and get passengers to their plane on time

Passengers want information:

1. Boarding time, gate number, changes
2. Location of gate and how to get there
3. Time it takes to get to gate

Can location-based services provide this information?

Give up privacy to obtain the information when passing through a transitional public place?



The Airport Case

Challenging environment for passengers and operators

Passengers:

- Frequent travelers need efficiency

- Occasional travelers need security, information, peace of mind

Operators:

- Complex logistics, queues, baggage, passenger services, security procedures, running a business



Infrastructure – the SPOPOS system



Indoor, location-based platform

Design guided by airport case – can be applied broadly

93% bring mobile phone when travelling – electronic boarding pass on mobile phones in near future

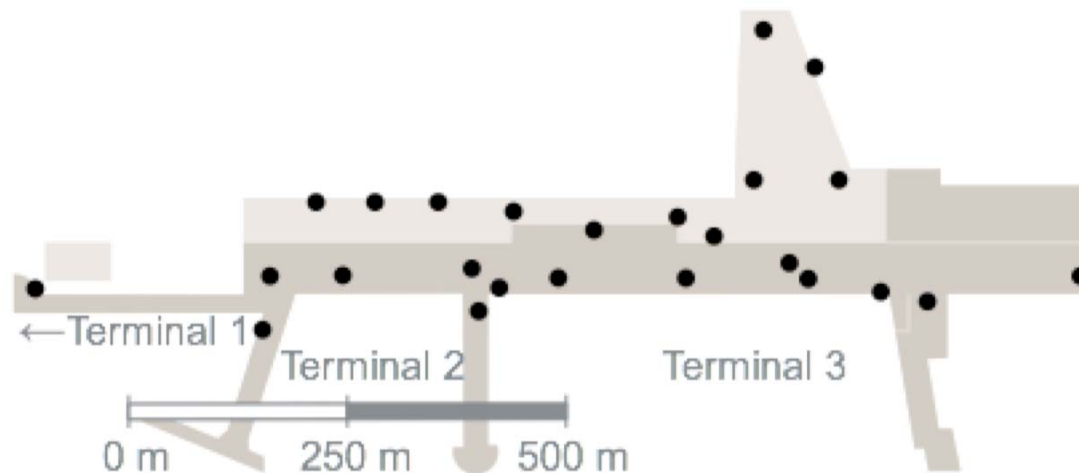
Use of Bluetooth and RFID to track passengers and their moving between zones

Web interface to services



Tracking zones

Mobile phone registration prior to departure – match number and tracking ID.
Tracking ID: either MAC-address of phone or RFID tag handed out at check-in
Almost 100% success rate in detection of Bluetooth and RFID



Location-Based Services for Operators

Overview of queue-building -> better manning of control points

Precise and individualized information to passengers

Fewer public calls for late passengers

Better passenger flow analysis

'Lean boarding'

BUT location-based systems raise privacy concerns for passengers



Location-Based Services for Travelers

Customized information sent to passengers' mobile phone

Reduce uncertainty

Reduce number of delayed flights



Remote view of passengers

PAX for flight

User: ls

Destination OSL	Flight SK452	Date 30-11-07	Nationality All	Age All	From All	To All	Travel Frequency All
Pier B	Hour 16:10	Residence All	Sex All	Purpose All			

Status	PAX ETA	Estimated walktime	Last RP	Seq. no.	Name	ID/Mobile number	Object	Object returned
🔴	16:15	10	12	42	-	1234567890	PAX tag	No
🔴	16:12	7	1	11	-	1234567891	PAX tag	No
🟠	16:09	4	5	32	Niels Nielsen	+4522222222	Mobile	-
🟡	16:06	1	6	8	-	1234567892	PAX tag	No
🟢	16:05	0	20	03	Niels Nilsen	+4533333333	Mobile	-
🟢	16:02	-	20	02	-	1234567893	PAX tag	No
🟢	16:00	-	20	117	Bjørn Bjørnsen	1234567894	PAX tag	No
🟢	15:58	-	20	01	-	1234567895	PAX tag	No
🟢	15:53	-	20	100	-	1234567896	PAX tag	No
🟢	15:52	-	20	10	-	1234567897	PAX tag	Yes
🟢	15:52	-	20	08	-	1234567899	PAX tag	Yes
🟢	15:49	-	20	53	-	1234567881	PAX tag	No
🟢	15:48	-	20	41	-	1234567882	PAX tag	No
🟢	15:47	-	20	22	-	1234567883	PAX tag	No
🟢	15:47	-	20	23	-	1234567884	PAX tag	Yes
🟢	15:45	-	20	71	-	1234567885	PAX tag	Yes
🟢	15:45	-	20	72	-	1234567886	PAX tag	Yes
🟢	15:42	-	20	35	-	1234567887	PAX tag	Yes
🟢	15:42	-	20	36	-	1234567888	PAX tag	Yes
🟢	15:40	-	20	18	-	1234567889	PAX tag	Yes
🟢	15:37	-	20	87	-	1234567871	PAX tag	Yes
🟢	15:35	-	20	66	-	1234567872	PAX tag	Yes

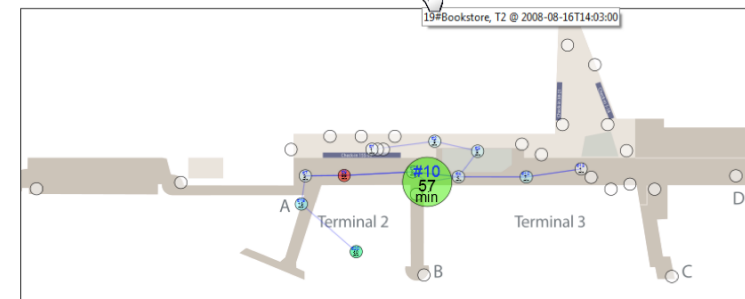
Rows per page: 25 | Print | Export

First 1-25 26-50 51-75 Last

16:05

Spopos PAX Trace

Compact trace: z33 z18 z16 z7 z5 z4 z1 z4 z5 z19 z7 z9 z14 z9 z7 z5 z4 z1 z3 z999



Auto-zoom | Reset view

Detailed trace for passenger:

Step number	Zone ID	Zone Name	First detection	Dwell time in zone
Total (all zones)				
				16200 min
#1	z33	00=Check In	2008-08-16T12:00:00	60 min
#2	z18	18=Security Entrance 2 - west-end	2008-08-16T12:05:00	300 min
#3	z16	16=Tax-Free entrance after SEC	2008-08-16T12:10:30	270 min
#4	z7	07=Nytovr	2008-08-16T12:16:00	30 min
#5	z5	05=Pier B square	2008-08-16T12:17:00	30 min
#6	z4	04=Starbucks T2	2008-08-16T12:18:00	60 min
#7	z1	01=Pier A Entrance	2008-08-16T12:19:30	120 min
#8	z4	04=Starbucks T2	2008-08-16T12:22:30	5850 min
#9	z5	05=Pier B square	2008-08-16T14:02:00	30 min

'Tag-along' view



Relatives can follow movements from password-protected website

I fortsætte et aktivt og fremmest om de ældre, strømperne på. Ved at udvikle for at tale sammen, siger ud- tmp@berlingske.dk



at uc og vi ældr fyndt og d mod tions søge ældr Fore nito egne kan t læst ænd så de some Elek skal i over og e bety præj ud at med

72-års at find Lufth i-hånd i rever spore via m. hun es i rette

digital hånd med på reisen

Privacy Implications of the Gatecaller

Privacy – even in public spaces

Depend on identity of observer

Tag-along offer comfort but also threatens individual privacy



Design methods

Scenarios and personas:

business traveler

teenage traveler -> tag-along

Confirm goals with airport professionals

Scenarios as basis for usability requirements,
design issues, system architecture

Observations among airport operators and
passengers

Interviewing airport staff



Prototypes

Passenger prototypes of Gatecaller Service

Better understanding of mobile interaction

Wizard-of-Oz tests

June 2007 among project members

December 2007 among press representatives

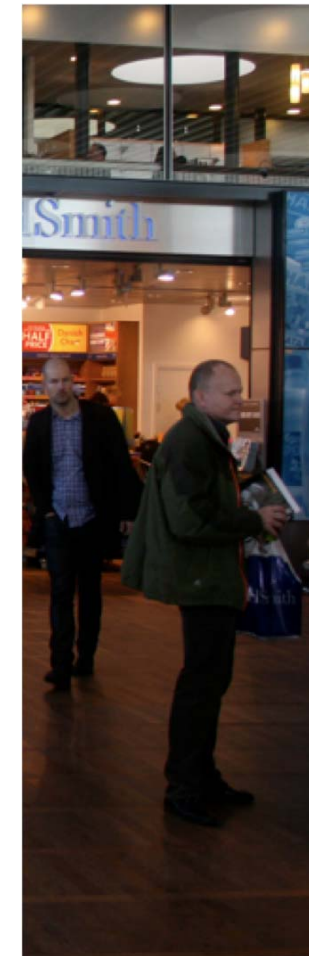
Operator and management prototypes tested
by heuristic evaluations and think-aloud
usability tests



Passenger Evaluation I

Responses given by passengers at gate to the question “Has it made you feel more secure that the gate personnel now may find you if you are late?”

[N = 76]	No, not at all	No, hardly at all	Yes, to some degree	Yes, to a large degree
	20%	20%	39%	21%



Passenger Evaluation II

Responses given by passengers at gate to the question “Have you felt yourself being monitored while you have been carrying the RFID tag?”

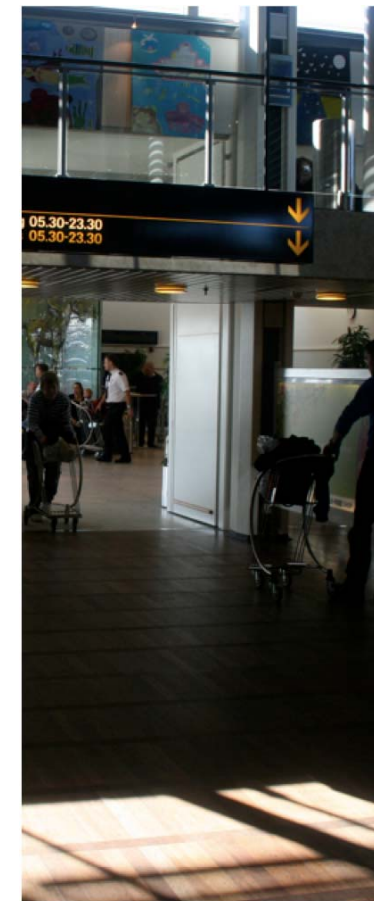
[N =116]	No, not at all	No, hardly at all	Yes, to some degree	Yes, to a large degree
	86%	9%	4%	1%



Passenger Evaluation III

Responses given by passengers at gate to the question “Has time spent on information influenced your movements in the airport?”

[N = 98]	No not at all	No, hardly any time	Yes, some time	Yes, a lot of time
	38%	27%	24%	12%



Discussion

Will finding generalize to other transitional spaces?

In airports, but not in general.

Trust in organization that requires information



“I don’t mind using the tracking service (.....) in this airport. Here I can see the benefits.

I would not use it in the shopping mall, where they would hunt me down with “offerings” all over the place” (Danish female, 40 years)

“I have no worries that information handled within governmental institutions would ever be used in any harmful way” (Dutch male, 34 years)

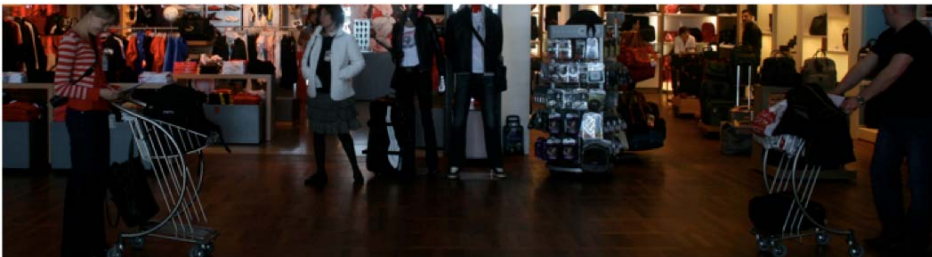
Discussion II

National / local differences
Openness and securing privacy

Actually experiencing being tracked might
change passengers' view on tracking

Accuracy of tracking

"I like the idea of this system. But I would not like it to know in detail when I am at the restroom" (Polish female, 24 years)



Discussion II

Is this an HCI or an interaction design approach to designing for passengers stay in an airport?



SPOPOS.COM

Want to know more about the project?
malmborg@itu.dk





Short break.

From HCI to Interaction Design



What is interaction design?

Designing interactive products to *support* people in their everyday and working lives

Sharp, Rogers and Preece (2002)

The design of spaces for human communication and interaction

Winograd (1997)

Shaping the use qualities of digital material

Löwgren (2002:186)



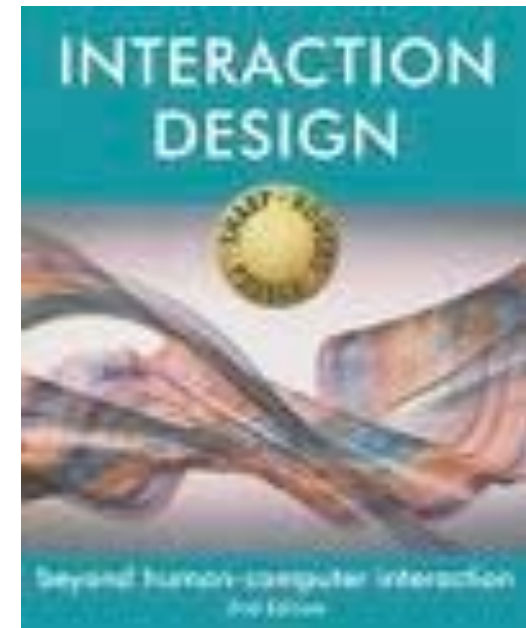
Interaction design according to Jonas Löwgren

Criticizing Sharp, Rogers and Preece:
Interaction design: Beyond Human-
Computer Interaction. Wiley, 2007.

From HCI (Human Computer Interaction)
to Interaction Design ... what does
that mean?

Jonas Löwgren: How far beyond human-
computer interaction is interaction
design?

Digital Creativity, 1462-6268, Volume
13, Issue 3, 2002, Pages 186 – 189



What is interaction design? Löwgren I

'Interaction'

time-based, non-linear nature of the digital
differs from most (all) other design materials

'Design'

parallel emergence of question and answer
exploring possible futures
synthesis of reason and emotion
intervention on many simultaneous levels in a design situation

HCI: focus on goals, tasks and usability
makes it rather limited in terms of positive innovation
'support' -> efficiency

Does it make sense to say that a computer game supports people?

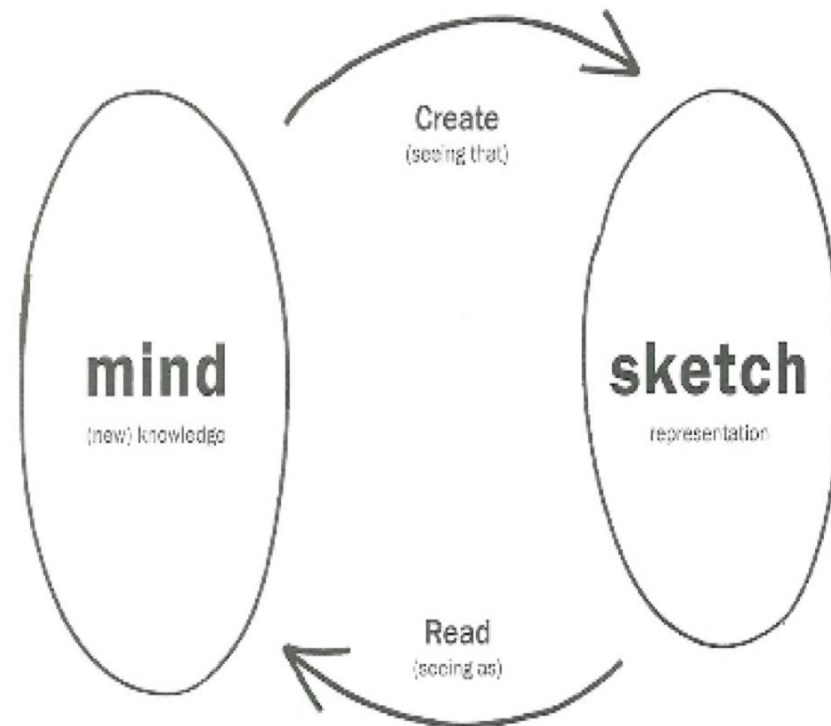
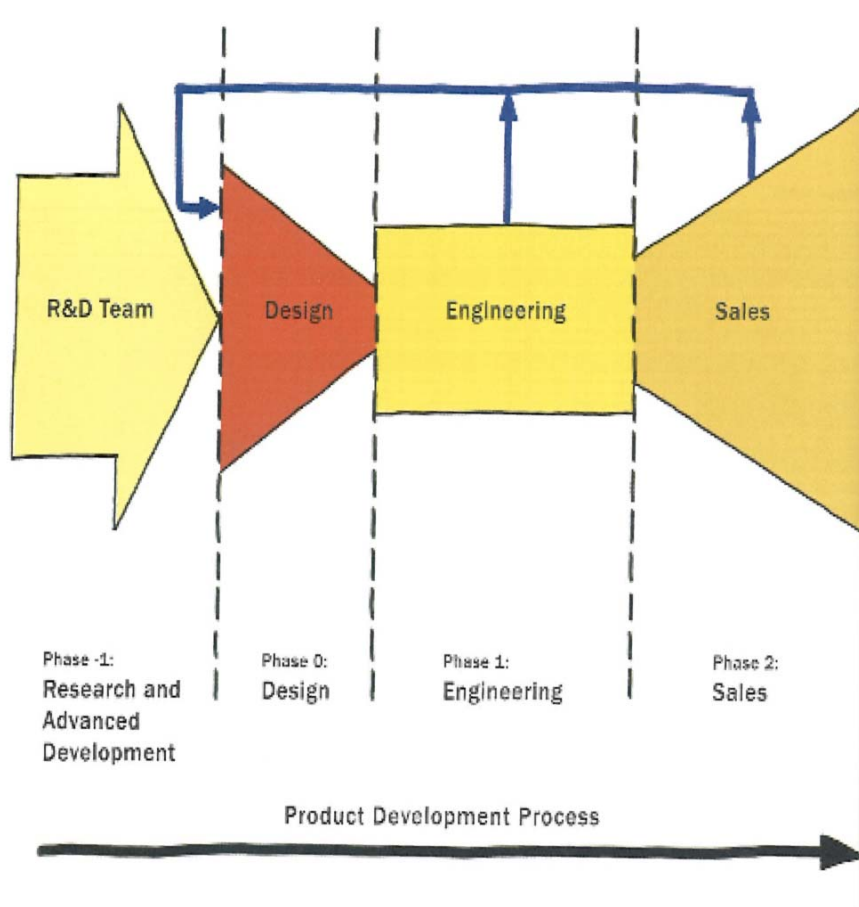
Assertion 1.

Interaction design is a design discipline, which means something other than the science-and-engineering perspectives of HCI.

(Buxton) 

Sketching user experiences - Buxton

Getting the design right and the right design



What is interaction design? Löwgren II

How can we approach the question of quality in interaction design?

HCI: quantitative usability goals

- > view design as knowledge construction within a community of practice
- > consider design-theoretical approaches to articulating the languages and meanings of products (so-called product semantics)
- > consider product or use genres as knowledge-organizing systems

We should imagine a field of interaction design criticism in analogy with more mature design fields such as architecture or graphic design.

Assertion 2.

The notion of quality in interaction design is not well developed. Neither are the social structures needed to develop and sustain the notion. An HCI perspective is not the most appropriate starting point.

What is interaction design? Löwgren III

Can we talk about aesthetic qualities of interaction design?

Interaction involves feeling as well as intellect; aesthetic qualities reside in the overall interaction, which is determined above all by the functions, structures, social action spaces and temporal qualities (the dynamic gestalt) of the system.

‘Obviously there’s the aesthetic of what something looks like or feels like but there’s also the aesthetic of how it works as well. You can talk about an elegant way of doing something as well as an elegant look.’

(Gillian Crampton Smith)

Assertion 3.

It makes sense to talk about aesthetic qualities of interaction. We have no adequate language as yet to do that talking. The language of HCI is not the best place to look for inspiration.

Digital Media and Design



What is Digital Media and Design?

acting in a global context

Georgia Institute of Technology and the IT University of Copenhagen are collaborating to meet the challenge of acting in a global context.

We are developing shared courses, podcasts of lectures and student projects across continents.

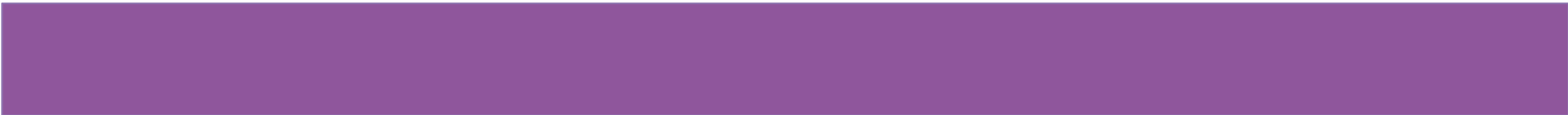
You can spend either a semester or a full year in an international environment with a Scandinavian approach to design and media.

theory – practice – projects

In the Digital Media and Design program you will work with mobile media, web 2.0 technologies, social networks, use contexts, interaction design, applications, business strategies, project management among other interesting areas

You will apply theoretical knowledge in a variety of practice fields – and get a theoretical framing of your practical competencies.

You will work with organizations and companies on projects focusing on development of concepts and prototypes.



		7,5 ECTS	7,5 ECTS	15 ECTS course and /or project
Year 3	Spring	Innovation and entrepreneurship	Philosophy of science	Bachelor project
	Autumn	Electives	Electives	Research project – academic publishing
Year 2	Spring	ITU electives	ITU electives	Concept development with industry
	Autumn	Mobile media and social it	Digital aesthetics	Understanding and engaging users
Year 1	Spring	Digital media cultures	Sketching and prototyping	Cross media project
	Autumn	Introduction to media and communication	Introduction to interaction design	Communication, project work and web design

What is IT University of Copenhagen

established 1999 - new building 2004 by Henning Larsen

1500 students, 300 staff / 80 faculty

cross-disciplinary university that approaches the study of information technology

from a variety of perspectives:

natural sciences (classic computer science)

software engineering

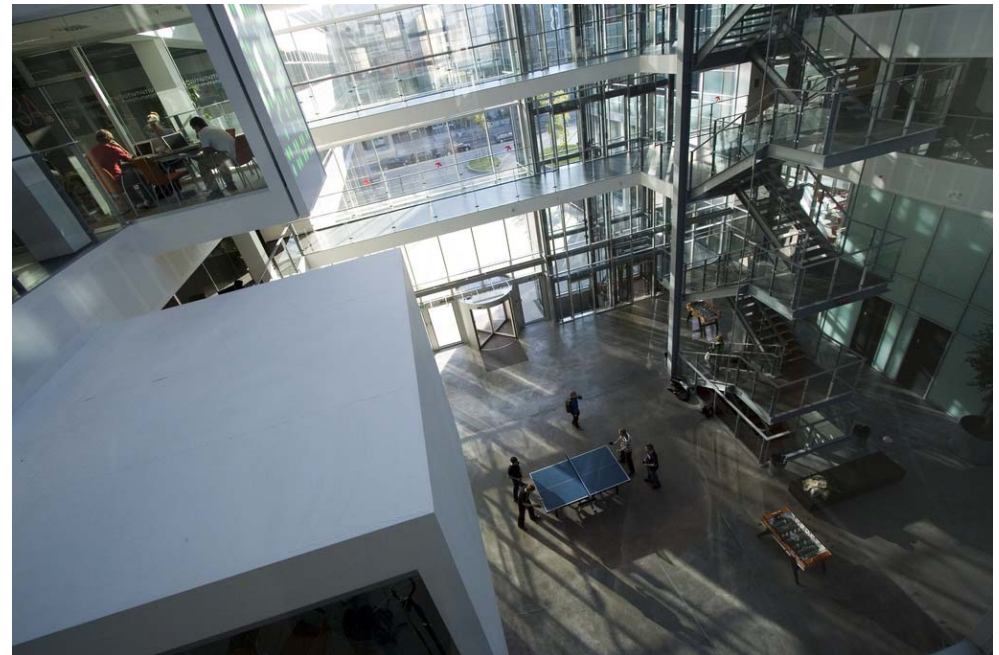
organizational use of technology

design and use of digital media

e-business

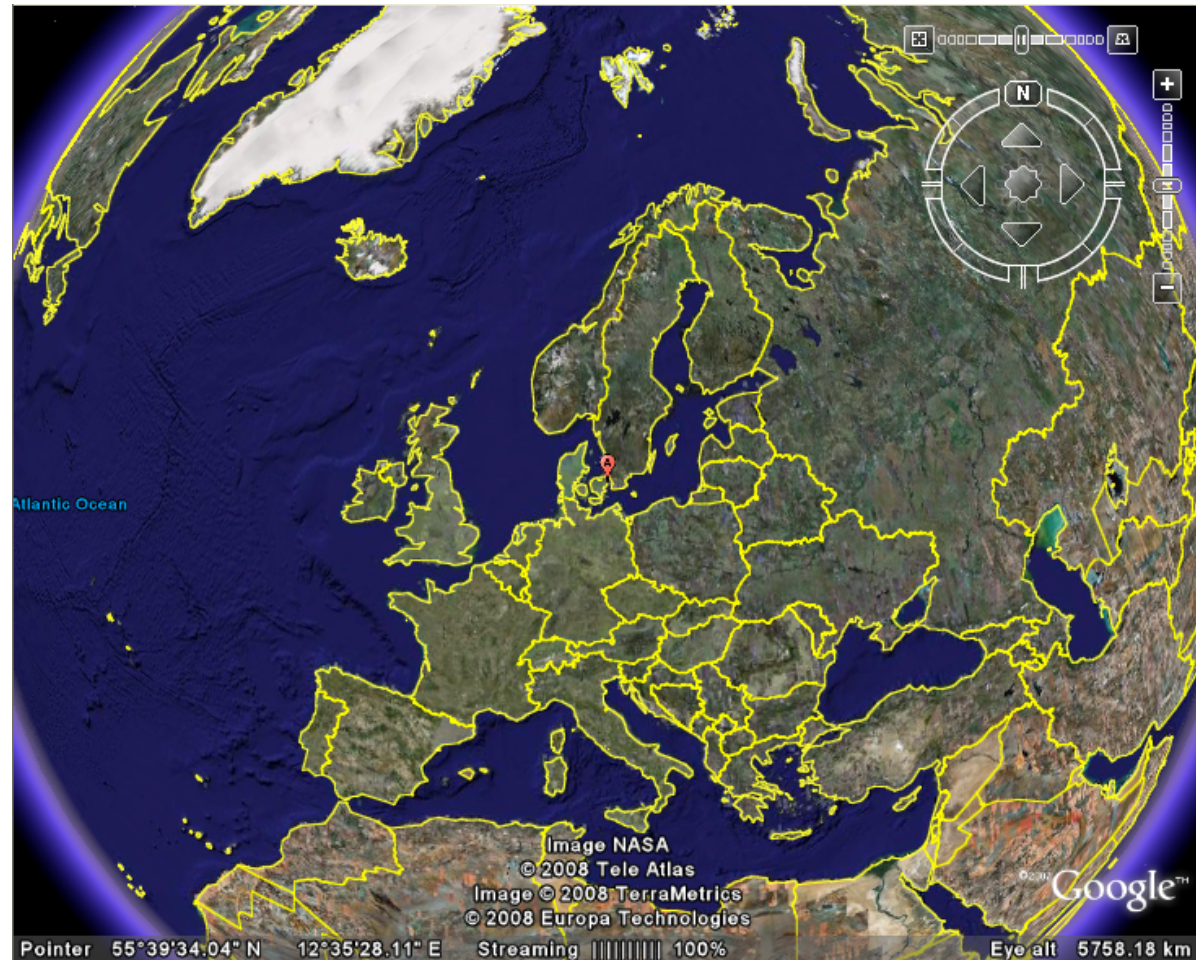
computer games studies, and

the social, cultural and aesthetic aspects of IT



What kind of country is Denmark (... and where are we) (5.5 mill people / 1.2 mill in Copenhagen)

- Constitutional monarchy with a parliamentary system of government
- The royal family is the second oldest reigning dynasty in the world, second to the Japanese emperors
- Large welfare state, ranks as having the world's highest level of income equality
- 2006 to 2008: ranked as "the happiest place in the world," based on standards of health, welfare, and education
- 2008 Global Peace Index: second most peaceful country in the world
- 2008: Copenhagen ranked the most livable city in the world by Monocle magazine



What kind of city is Copenhagen





Monocle gave the city the special award as "Best Design City" Scandinavia's most desirable city
2008 Worldwide Centers of Commerce Index:
Copenhagen was ranked 14th in the world and 1st in Scandinavia



Classified as a GaWC Cultural World City
Ranked 3rd in Western Europe in terms of attracting regional headquarters and distribution centers, only surpassed by London and Paris

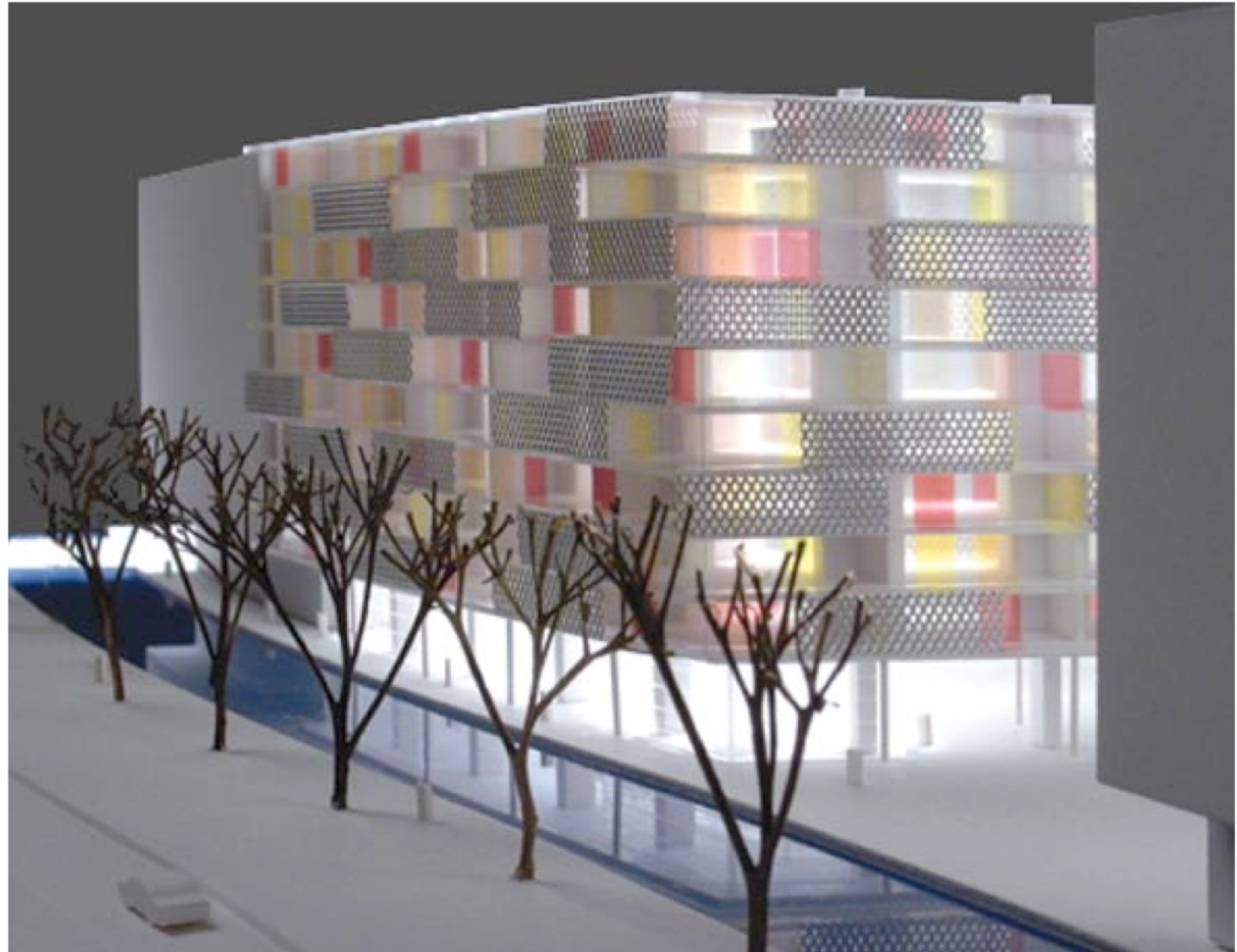
Copenhagen is described as "The Paris of the North" because of its Design, Fashion and Beauty



Student residences – Tietgen kollegiet



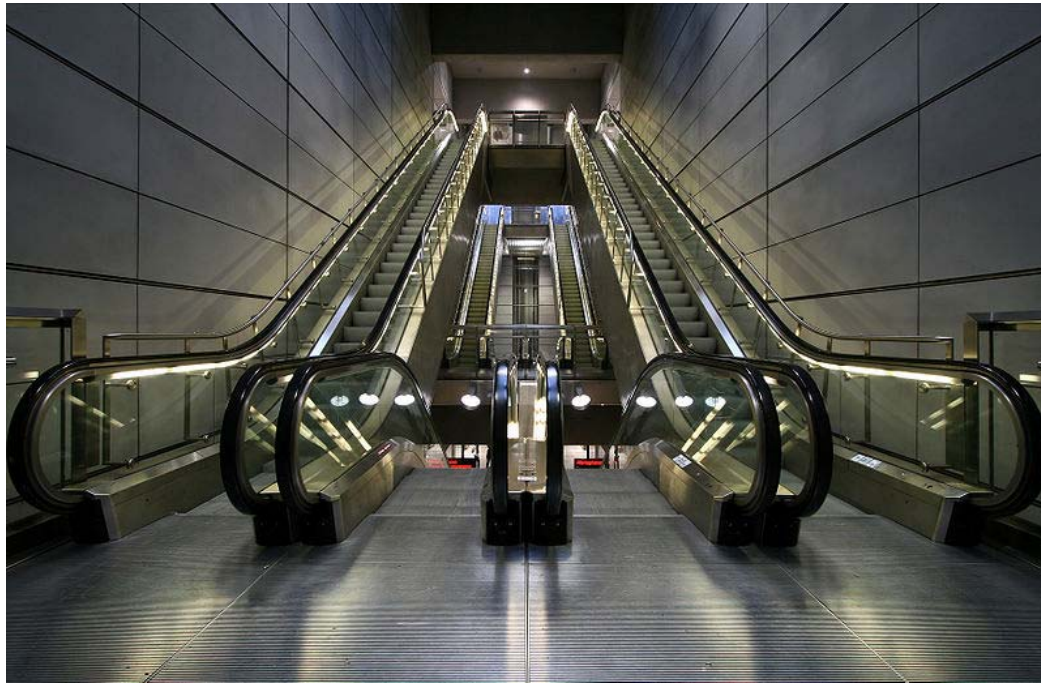
Student residences – Signalhuset



Student bar – Scroll bar



Student transportation – metro & bicycle



Student life – rock music & city art



What kind of collaboration opportunities do we offer

Academic year 2010/11 and ongoing ...

GaTech students can spend one semester
or a full year at IT University of
Copenhagen

Now

Shared projects between students on all
level

Faculty exchange