ICT EDUCATION TEACHER WORKSHOP

BACKGROUND FOR THE ICT EDUCATIONS

KAJ GRØNBÆK, PROFESSOR

DEPARTMENT OF COMPUTER SCIENCE,
CENTER FOR INTERACTIVE SPACES,
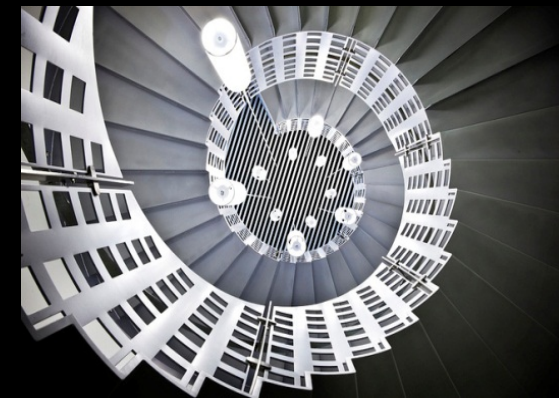AARHUS UNIVERSITY

KGRONBAK@CS,AU.DK

MANAGER FOR INTERACTIVE SPACES LAB,
ALEXANDRA INSTITUTTET A/S

PLAN

› Department of Computer Science
› Background and motivation for the ICT education
› Short overview of education structure
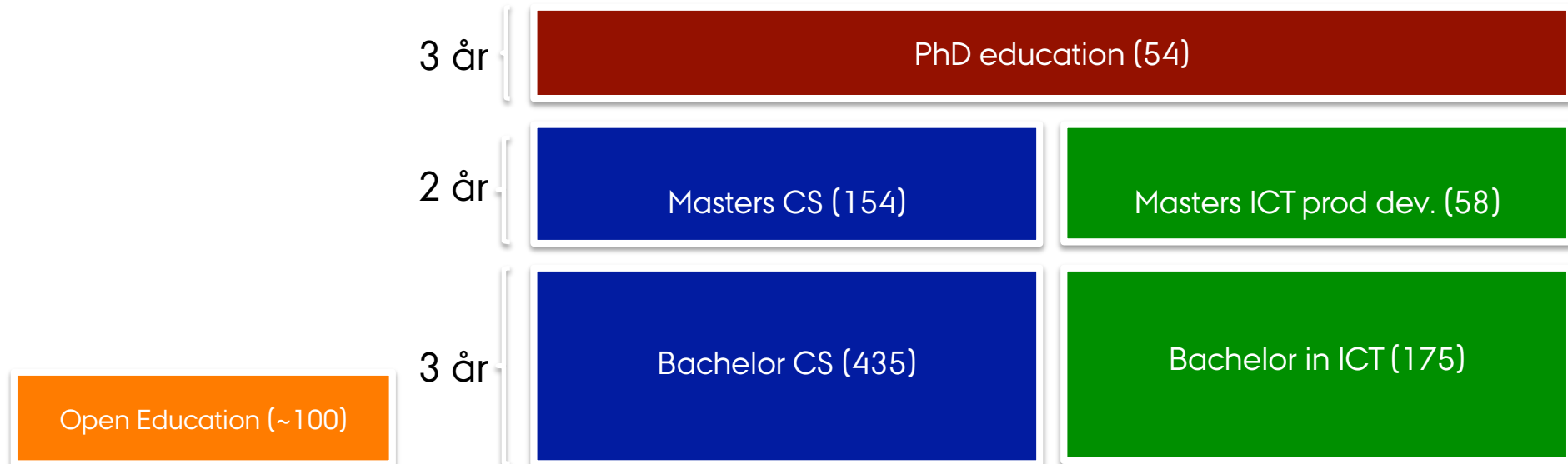› Examples of courses and thesises
› Job situation
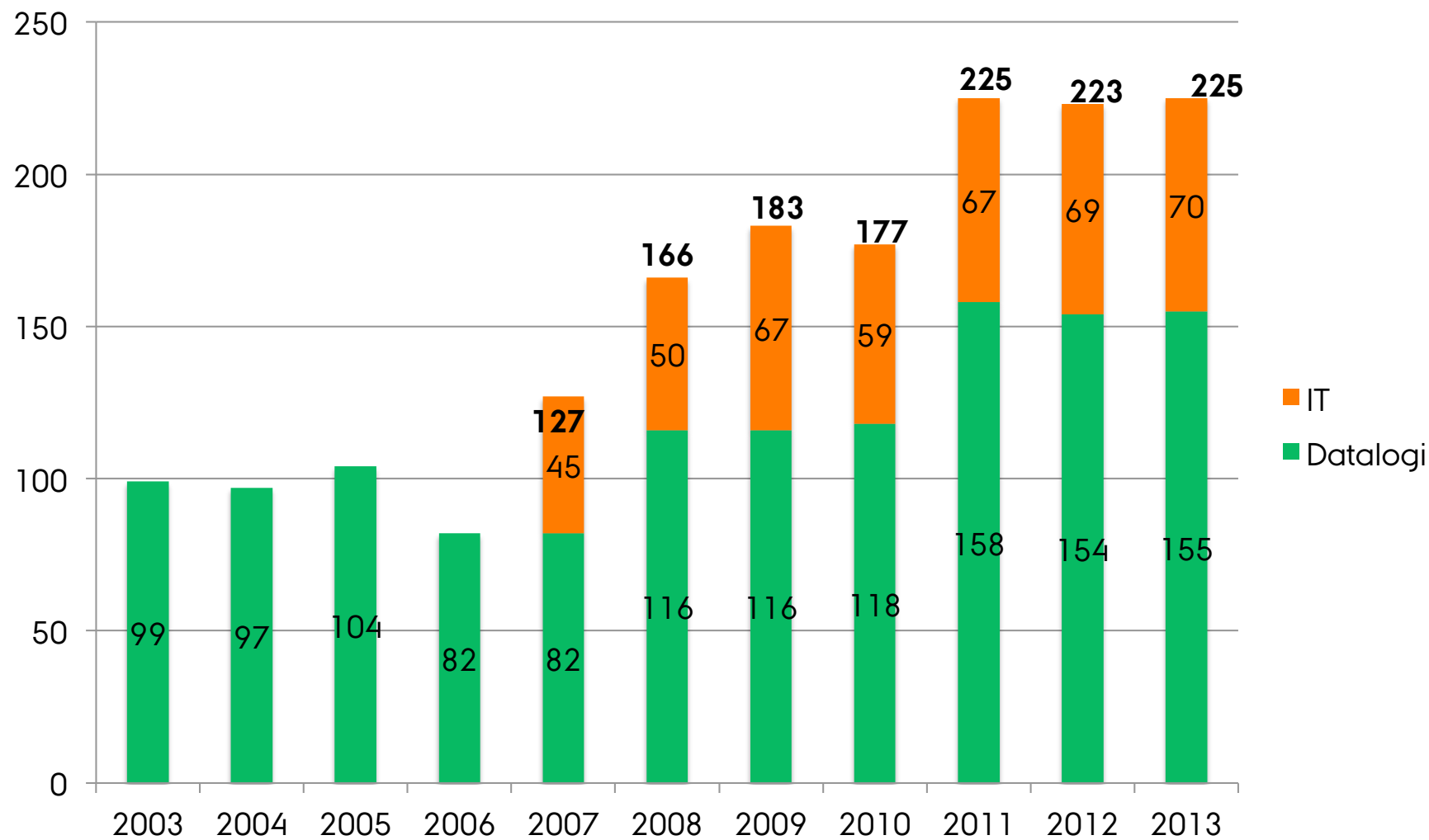› Questions

DEPARTMENT OF COMPUTER SCIENCE

DEPARTMENT OF COMPUTER SCIENCE, AU

› 150 staff members
  › 50 VIP (25 tenure).
  › 65 PhD students (1/3 from abroad).
  › 10 TAP + 25 part time student jobs

› ~1000 students
  › Computer Science
  › ICT-Product Development
  › Candidates mainly work in industry

› ~50 mio dkr/year in external funding
› Most productive Danish CS
  › 3,8 publications pr VIP pr year
  › 1/3 tenured staff has a 20+ H-index

› Algorithms and Data Structures.
› Data-Intensive Systems.
› Cryptography and Security.
› Mathematical Computer Science.
› Computer Graphics and Image Processing.
› Ubiquitous Computing and Interaction.
› Computer-Mediated Activity.
› Use, Design and Innovation.
› Programming Languages.
› Bioinformatics

VOLUME OF EDUCATIONS AT CS ~800 STUDENTS

3 år	PhD education (54)	
2 år	Masters CS (154)	Masters ICT prod dev. (58)
3 år	Bachelor CS (435)	Bachelor in ICT (175)

Open Education (~100)

ENROLLMENT CS 2003 - 2013

Legend: IT (orange), Datalogi (green)

Year	Datalogi	IT	Total
2003	99		
2004	97		
2005	104		
2006	82		
2007	82	45	127
2008	116	50	166
2009	116	67	183
2010	118	59	177
2011	158	67	225
2012	154	69	223
2013	155	70	225

PRODUCTION (CAND.SCIENT.DATALOGI)

> AU: 1503 kandidater, 215 ph.d.

> KU: 1349 candidates, 63 ph.d. (>= 1995 for ph.d.)
> AAU: 495 candidates, 79 ph.d.
> SDU: 394 candidates, 53 ph.d.
> RUC: 232 candidates, 30 ph.d. (>= 1999 for candidates)
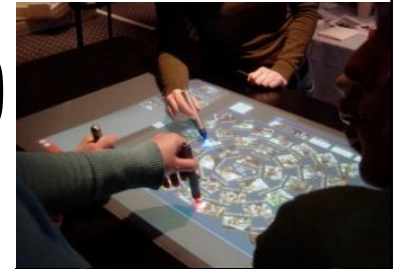
> 38% candidates in DK

> 48% ph.d. in DK

BACKGROUND AND MOTIVATION FOR ICT EDUCATIONS

TIMELINE

> **1997**: Multimedia education with CS and Information Studies, and Aesthetics departments is established.
> **1999**: First Interdisciplinary Interactive Spaces course between Aarhus School of Architecture, Department of Computer Science, Information Studies, Design School in Kolding
> **2001-2005**: Informal and semi-formal discussions establishment of a common eDesign education
> **2003**: Center for Interactive Spaces is established with KG (Manager) and Hans Peter Svendler Nielsen (Co-manager)
> **2005**: AU sets up a goal to enroll 100 new students within IT
> **2006**: CS/AAA wrote an accreditation proposal for the ICT bachelor and Information Studies/Aesthetics writes a proposal for Digital Design.
> **2007**: The first 60 ICT bachelor students are enrolled.
> **2009**: CS/AAA wrote the accreditation proposal for the ICT Masters
> **2010**: We were ready to enroll ICT Master students.

CENTER FOR INTERACTIVE SPACES (2003-…)

› Interdisciplinary research
  › Computer Science, Architecture, Design, and Engineering
› Ubiquitous Computing - ICT in the physical environment
  › Infrastructure, interaction techniques, physical design, products, building components, new user experiences
› Research projects with industry involvement
  › research projects and consultancy projects
  › Activities for 100+ mio. dkk sofar
› Application domains
  › Homes, schools, libraries, public spaces, museums, attractions, cars, and work places
› Customers/Partners:
  › B&O, LEGO, ARLA, Arkitema, Solutors, Systematic, Theater Katapult, several municipalities,…

ALEXANDRA
INSTITUTTET

INTERNATIONAL INSPIRATORS FEATURING CS + ID

› Stanford University,
  › Interaction Design, http://hci.stanford.edu
  › d.school, http://dschool.stanford.edu

› Carnegie Mellon University
  › Computational Design Lab, http://code.arc.cmu.edu

› Georgia Tech,
  › Interactive Product Design Lab, http://www.id.gatech.edu/research/labs

› ...

IDEA AND BACKGROUND

› Focus on ICT-product development
  › From "systems" to(mass produced) ict-products
  › Software, physical design, business models
  › Inddrage kompetencer fra AAA og BSS

› Innovation processes
  › FROM pure problem solving
  › TO problem definition, concept design, and problem solving
  › Focus on commercial and societal value

› Introduce project oriented teaching
  › Without tipping over to the Aalborg Model ;-)

› Industrial orientation e.g. through study jobs
› Internationalization through "internships" abroad

THE ICT EDUCATIONS

› Combines computer Science, with Design/Architecture, and Business Modelling

› Department of computer, AU

DATALOGISK INSTITUT
DET NATURVIDENSKABELIGE FAKULTET
AARHUS UNIVERSITET

› Business and Social Sciences, AU

**Aarhus School of Business
University of Aarhus**

Handelshøjskolen
Aarhus Universitet

› Aarhus School of Architecture

BACHELOR + MASTERS PROGRAM

AARHUS UNIVERSITY

Masters

Year	Q	Col 1	Col 2	Col 3
5.år	Q4	Speciale		
	Q3	Speciale		
	Q2	Valgfri	Valgfri	Valgfri
	Q1	Valgfri	Valgfri	Valgfri
4.år	Q4	Innovationsprojekt		
	Q3	Augmented Reality	Urban Intervention	P2P Based Web Tech
	Q2	Pervasive Positioning	Interaktive Rum	Server Based Web Tech
	Q1	Context Awareness	Shape Changing Int.	Client Based Web Tech

Bachelor

Year	Q	Col 1	Col 2	Col 3
3.år	Q4	Videnskabsteori	Social og Æstetisk	Valgfri
	Q3	Valgfri	Social og Æstetisk	Valgfri
	Q2	Bachelorprojekt	Oplevelsesdesign	Valgfri
	Q1	Bachelorprojekt	Adv. Physical Comp,	Valgfri
2.år	Q4	Vis. og projektkomm.	Designteori og -historie	Praksisprojekt
	Q3	Algoritmer & Datastr.1	Statistik og Databeh.	Praksisprojekt
	Q2	Computerarkitektur	Udviklingsmetoder	Innovationsprocesser
	Q1	Pervasive Computing	Interaktive Medier	Databaser
1.år	Q4	IT-Produktdesignprojekt		
	Q3	Interaktionsdesign	Fysisk Design	Webteknologi
	Q2	* Calculus 2	Org. og IT-Inno	* Programmering 2
	Q1	* Calculus 1	Store IT-Innovationer	* Introd. Programmering

Kaj Grønbæk   2014

EXAMPLES OF COURSES

GREAT ICT INNOVATIONS - COURSE PLAN 2013

> Uge1.1: Computer, Mouse, Desktop
> Uge1.2: The personal computer
> Uge2.1: World Wide Web
> Uge2.2: Search engines
> Uge3.1: From Desk to Palm
> Uge3.2: Ubiquitous Computing
> Uge4.1: Mobile Web
> Uge4.2: Computer Games and IT for Play
> Uge5.1: Multisensor and multimodal
> Uge5.2: People and prototypes
> Uge6.1: User-driven Innovation
> Uge6.2: Innovation models 1
> Uge7.1: Innovation models 2 + Wrap Up
> Uge7.2: No Lecture – work on final mandatory exercise

Not Covered:

> Programming languages
> Chips and semi-conductors
> Algorithms and data structures
> Robotics and AI
> GPS
> Computer Graphics
> Virtual reality
> ...

Evaluation:

> 3 mandatory individual reports

LITERATURE

Primary reading

› Bill Moggridge: Designing
Interactions. MIT Press 2006.

  › http://www.designinginteractions.com/book

› Tim Berners-Lee: The World Wide
Web: Past, Present and Future,
August 1996

  › http://www.w3.org/People/Berners-Lee/1996/ppf.html

› Mark Weiser: "The Computer for the
21st Century"

  › http://dl.acm.org/citation.cfm?id=329126

INTERACTIVE MEDIA – CONCURRENT WITH PvC

Uge	Dobbeltforelæsning	Pensum	Enkeltforelæsning	Pensum
1 28.08	Første time: Intro til kursus Intro til mini-projekt **(KG)**		Anden og tredje time: Interactive narratology and basic narrative models **(MN)**	Ryan Intro + Ch. 1 and 5
2 04.09	Evt. fortsættelse af Ryan Ch. 5 **(MN)** Resten af tiden: Mobile location-based narratives and experiences **(KG)**	Hansen, Kortbek & Grønbæk 2011(Hansen_Kortbek_Gronbaek2011.pdf) Gordon & de Souza e Silva Ch. 3 (Gordon_de_Souza_e_silva_kap_3+4.pdf) Ballagas et al.(ballagas.pdf)	Fortsat fra dobbeltforelæsning **(KG)**	
3 11.09	Computer games and their narrative structure**(MN)**	Egenfeldt-Nielsen et al. Ryan Ch. 8 (UnderstandingVideoGames-ch8.pdf) (Magerkurth et al.)	Fortsat fra dobbeltforelæsning.	
4 18.09	Remediation and New Media genres **(MN)**	Bolter & Grusin Intro + Ch. 1		
5 25.09	Interactive Fiction, HyperFiction and Web-based narrative **(MN)**	Ryan Ch. 6 + 7		
6 02.10	Mediated Spaces **(KG)**	Kortbek & Grønbæk (artfp7647-kortbek.pdf) Krueger 1977 (25-kreueger-03.pdf) Gordon & de Souza e Silva Ch. 4 (Gordon_de_Souza_e_silva_kap_3+4.pdf) Bolter & Grusin Ch. 10 (Dindler et al. a20-dindler.pdf)	(Rundvisning i CAVI som eks på medierede rum) **(MN)**	
7 09.10	Afslutning, evaluering og eksamensprep **(KG/MN)**		Afslutning fortsat	

2014

MATERIAL

› Ryan, Avatars of Story, (50% of book, to be bought)
  › Focus on narrativity

› Bolter & Grusin, Remediation (15 % of book copied)
  › Concepts for new media
  › Overview of new media genres

› Supplemental articles on CourseAdmin
  › Concrete usage of Ryans methods
  › Perspectivating papers

EVALUATION/EXAM

› Mandatory exercise
  › A mini-project in common with Pervasive Computing
  › Produce a mobile application/game with narrative
  › Groups of up to 4 students
  › Must pass to attend exam

› Oral exam
  › Individual
  › Mini-project should be used as example when using concepts

PROJECTS

SEVERAL TYPES OF PROJECTS

› itPDP first year (15 ECTS)
  › Project framed with an overall theme
  › 10 weeks work, no courses, some lectures
  › Prototype developed for evaluation and presentation at exhibition

› Praxis Project on second year (10 ECTS)
  › Empirical study of a selected commercial product development project/product
  › Focus on evaluation, method and alternatives

› Bachelor project on third year (10 ECTS)
  › Research topic frame the project
  › Formulate hypothesis, experiment, report as paper, and a local mini-conference presentation

› Innovation project on fourth year (15 ECTS)
  › Longer project development project with a specific company
  › Examples: B&O and VW

ITPDP – PROJECT SUBJECTS

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› 2008 – IT-products for Future News
› 2009 – IT-products for Nightlife
› 2010 – IT-products for Public and Semi-public Buildings
› 2011 – IT-products for Digital Sports grounds
› 2012 – IT-products for Welfare
› 2013 – IT-products for Event Communication and

THESIS TITLES

› Gamification in a Rehabilitation Process: Exploring Technology Based Solutions for Heart Patients.

› Developing Multi Touch Interactive Visualizations to Explore Big Data.

› The Myth of Natural User Interfaces: How Contextual Understanding and Existing Knowledge Lead Towards Natural Interaction

› Ad Hoc Interfaces: A Tangible Approach to On-demand User Interfaces

› Peripheral Display as a Motivator: An Exploratory Case Study on Motivating Employees in an Open Office Environment

› Context Aware IT Support for Children with ADHD - Development and test of the CASTT Prototype

› Wind Power and Electricity Price Prediction Using Artificial Neural Networks to Support Decision Making in the Danish Electricity Market

› Let´s Graffiti! Designing and experimenting with a collaborative drawing tool for children based on Clark´s concepts of Common Ground

› Styrkede sportsoplevelser: Udviklingen af CAP Frameworket

IT-PRODUCT DEVELOPER JOB TYPES

Job Summary

Company
Walsworth Publishing
Company

Location
Kansas City, MO 64131

Industries
Printing and Publishing

Job Type
- Full Time
- Employee

Years of Experience
2+ to 5 Years

Education Level
Bachelor's Degree

Career Level
Experienced (Non-
Manager)

Interaction Designer

About the Job

Walsworth Publishing Company, a technological leader in the printing industry, is excited to offer a great opportunity to the right candidate as an Interaction Designer, in our Strategy and Innovation Department.

The Interaction Designer will define the directional and detailed user experience for a wide range of highly interactive web applications and software, delivered on desktop, mobile, and tablet devices. The Interaction Designer will engage in a multi-step process that moves through several levels of media, including: sketches, diagrams, digital comps, high and low fidelity prototypes, detailed UI design blueprints and specification documents.

A successful candidate must have a Four-year college degree in Interaction Design or related field, and at least 2 years of user-interface and interaction design experience. This person must have a strong understanding of visual design, conceptual design, and human factors and usability best practices. Experience with usability testing or other research methodologies is a plus. Candidates must present a portfolio showing exceptional, effective interface design work.

Walsworth offers a full benefits package. Compensation based on experience.

All candidates must submit a resume, cover letter, and salary history to be considered.

We are an equal opportunity employer.

EXAMP...

User Experience Designer, Senior - MCP
Job Category: Software Engineering: ...
Location: United States, WA, Redm...
Job ID: 744339
Product: Windows Phone
Division: Mobile Com...

Help us change th...
around the ...
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UX Designer, Senior ...

... (744339)

Game Designer-IEB-MGS (742097)

Job Ca...
Locati...
Job ID...
Divisi...

Job Category: Software Engineering: Creative
Location: United States, WA, Redmond
Job ID: 742097
Division: Interactive Entertainment Business

The Se...
applica...
create ...

You sh...
designi...
for des...
as well...

Our te...
Micros...
experie...

Respo...
• Effe...
• Fluic...
• Coll...
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• Dev...
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• Exc...
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Microsoft Game Studios' Mobile division is looking for a motivated, talented, and driven Game Designer to create compelling mobile game
experiences for Windows Phone and beyond. The Game Designer is expected to perform day-to-day design implementation tasks, embrace
and uphold creative vision, solve creative design challenges, and build and balance compelling game systems. Candidates must be
creatively flexible, able to adapt to various genres and game types as well as keep up on a rapidly changing mobile market and the
challenges that developing games in that space brings.

RESPONSIBILITIES:
• Create game systems and content for the titles they are developing.
• Create and maintain design documentation across multiple titles.
• Create and champion new game concepts in collaboration with the MGS Mobile design team.
• Help to create and uphold the game pillars and vision of the titles they work on.
• Push product quality to meet the high expectations of Microsoft Game Studios first party titles.
• Work effectively with the Creative Director and any other key staff to create and hone the best possible designs for a variety of game
types.
• Contribute innovative and creative design ideas for both current and future titles.
Assist other MGS studios with development knowledge in building quality mobile experiences.
• Participate in team development meetings, reviews, and testing, contributing constructively to the game development process.

QUALIFICATIONS:
• 4+ years of entertainment industry experience in game design, with at least 4 shipped titles on current generation platforms.
• An understanding of games, game players and gameplay mechanics, with an emphasis on mobile platforms.
• Strong verbal, written and organizational skills.
• Ability to quickly learn and leverage a variety of tools for game construction.

THE IDEAL CANDIDATE WILL:
• Have led the design or a major component of the design of one or more of the titles they have developed in the past.
• Enjoy working on smaller titles with shorter production schedules.
• Enjoy working on a diverse set of titles - from core to casual games - with a good understanding of what makes each genre compelling to
its audience.
• Be passionate about the mobile game space, including phone and handheld platforms.
• Be an avid game player, with the ability to talk about and reference games and designs to illustrate and/or support their design choices.
• Have an open-minded approach to design and display the ability to challenge convention.

... for millions of everyday users
... ceptualize and lead the design
... aking a real impact on future

... Phone. We're looking for
... position requires strong
... quickly broaden your
... ating great product

... d marketers and

... internally and externally.

... o design world-class end-to-end experiences that are desirable,
... m. Our goal is to ensure full integration of brand, industrial design,

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Card 1 (template labels):

Requisition Number
Job title
Location
Country
City
State/Province
Job type
Job description

Card 2:

Requisition Number 5848544
Job title App Development SE - iPhone
Location
Country
City Atlanta
State/Province United States
Job type Chicago
Job description Illinois

Full Time

The iOS Enterprise App Engineer will work with busi...
customers, internal Apple sales resources, and o...
drive the development of iOS Apps in enterp...
Engineer will be responsible for deliverin...
workshops, architecture reviews, per...
providing guidance to enterprise...
development cycle of an App...
technical, project manage...
skills and the ability to...
direction. BA/BS...
experience.

The s...
b...

Required:
- BS in computer science or equivalent.
- Strong object oriented programming
  with synchronous and asynchronous code.
- Proven track record writing Multi-threaded code and experience
  with lower OS layer.
- Experience developing UI for media applications that interfaces
  skills.
- Excellent problem solving, critical thinking, and communication
- Experience at the application and user interface level with at le...
  one of the following: Mac OS X API's, Java, C++, C, Win32
WindowsCE
-Familiarity with Unix.
s...
wor...
they a...
organiza...
to make an...
At least 50% tra...

Card 3:

Requisition Number
Job title Location
Country
City
State/Province
Job type
Job description

4377634
iPhone Media Applications UI Developer
Santa Clara Valley

Full Time
iPhone Media Applications UI Developer

Be a part of the most exciting technology on the market today,
iPhone Media Application Development. This is the software that is
changing the world. Are you ready for the challenge? The iPhone
Media Applications Group is looking for a proactive, highly
motivated engineer with more than 0-2 of years experience in
handling a wide variety of tasks related to media application and UI
development.

Along with excellent skills in object-oriented software design and
programming, the successful candidate will have real-world
experience optimizing size and performance of applications and
frameworks. You will be responsible for implementing new features
in existing applications as well as developing complex applications
from top to bottom, with a primary focus on User Interface
development.

rønbæk

28
2014

JOB TYPES

Engineering Application Eng...

ditmer

Om ditmer
Kontakt
Su...

SCADA Application Developer

Suzlon Energy – supplier of wind turbine generators and wind power plants – has ambitions to become the world's third largest wind turbine manufacturer within the next years. Suzlon Wind Energy A/S is a subsidiary based in Denmark and acting on the substantial growth in a number of markets. We are continuously looking for skilled and committed employees with the ability and drive to become part of our global team.

We employ the best professionals to be able to offer the high quality of service expected by our customers.

The strong Technology Group, led from its R&D Headquarters in Hamburg, derives its technological success from a close collaboration between the development teams in Germany, Netherlands, Denmark and India.

International virksomhed i Århus søger en SCADA Application Developer til udviklingsafdelingen.

OPGAVER
Software application udvikling herunder:
- Analyse/design, implementation, testing og vedligeholdelse af SCADA application suite
- Research af nye relevante teknologier
- Software Architecture
- Project management
- SCRUM / Agile development

DINE KVALIFIKATIONER
Erfaring fra lignende stillinger, herunder:
- Erfaring med ASP.NET, WPF, WCF development (Long Term)
- Erfaring med Microsoft Development Platform (Visual Studio 2005, 2008, 2010)
- Du er datalog, civilingeniør eller lign.
- Du er selvstændig, udviklings-orienteret kvalitetsbevidst teamplayer med analytiske evner.

SUZLON TILBYDER

Et spændende og varieret job med store muligheder og udfordringer. Arbejdsmiljøet er præget af kreativitet og en uformel omgangstone.

Du er velkommen til, at hente yderligere informationer om stillingen hos PM Consult på tlf. 70 20 44 10

Er du interesseret i at søge stillingen følg anvisningen nedeste på siden.

Gem til "dine job

CONCLUSION

› Lots of UX jobs nationally and internationally

› Lots of new ICT products hits the market
  › Sports
  › Healthcare
  › Homes
  › Transport

› Strong software competences is a must!
› Physical interaction competences is a must!
› Physical form and graphical skills are important!
› Engineering comptences are important!

Interdisciplinary collaboration necessary