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Welcome to the 13th international conference on Interaction Design & Children, June 17.-20. 2014 in Aarhus, Denmark. The mission of the IDC conference is to bring together researchers, designers and educators to explore new forms of technology, design and engaged learning among children. The conference incorporates papers, presentations, speakers, workshops, participatory design experiences and discussions on how to create better interactive experiences for children. IDC 2014 offers wide-ranging program, supporting and facilitating the exchange of ideas within and between all of these communities. The theme of this year's conference is 'Building Tomorrow's Technology – Together'.

We live in a global society where digital artefacts have become part of the everyday lives of children. Be it education, sports activities, rehabilitation or play, technology has come to play an important role in the way children relate to their physical, social and cultural surroundings. IDC 2014 invites researchers and practitioners to share their work on how technology affects children's well-being and sense-making in a global context and how children, their parents, teachers and peers can contribute to the design of new technology. We invite researchers and participants to share thoughts on emerging technology, new theoretical perspectives, design methods and approaches, and the understanding of these ideas for the benefit of children's development by questioning how we can build tomorrow's technology – together.

In Denmark, the Interaction Design and Children community is forged from research institutions and leading industry partners exploring aspects of children's play, learning and leisure as a foundation for technology design. For the IDC 2014, Aarhus University (AU), The LEGO[®] Foundation and INTEL have come together to create a venue for researchers and practitioners to work with theoretical, practical and methodological challenges in IDC.

Director of Transformative Learning Technologies Lab at Stanford University, Paulo Blikstein opens the IDC 2014 conference with a keynote on the designers' mission in the age of ubiquitous technology. According to Paulo Blikstein, we need to design devices, environments, and activities that reflect children's multiple epistemological resources and heuristics. The keynote is followed by two days of 18 full paper presentations, 44 short papers and 21 demos carefully selected through a double blind review process by the IDC program committee.

A new feature of IDC 2014 is a full day interactive forum for all conference attendees around the topic: How does the interaction with digital creative tools support child development? The focus in this session is on how children will develop with digital technologies and the ways we can inspire them to create their own digital tools. Different aspects of this question are addressed in groups prior to the workshop. Professor Marilyn Fleer from Monash University kicks off the session with a keynote on the relations between play and learning in digital environments - the significance of motives and demands. The keynote is followed by a challenge session facilitated by The LEGO[®] Foundation and LEGO[®] employees from different parts of the research and product development groups. The day ends with a closing panel session

where topics from the challenge sessions and the IDC 2014 Conference in general are discussed and elaborated by people from research and industry. The interactive workshop day is hosted by The LEGO[®] Foundation in their headquarter in Billund, Denmark. The LEGO[®] Foundation provides IDC 2014 attendees an opportunity to go on an exclusive factory tour as part of the IDC closing program.

Ole Sejer Iversen

General Chair Aarhus University, Denmark

Bo Stjerne Thomsen

Conference Co Chair The LEGO Foundation, Denmark

Lars Elbæk

Conference co-chair University of Southern Denmark, Denmark





08.15

Registration desk opens

INCUBA Science Park, Åbogade 15, 8200 Aarhus N

09:00

Workshops and Doctorial Colloquium opening session

INCUBA Science Park

ROOM 137: Interaction Design with Children with Disabilities

ROOM 147: Design for Repurposing: Rethinking Children's Interaction with Tangibles

ROOM 139: IBooC 2014: Second Workshop on Interactive e-Books for Children **ROOM 120:** Doctoral Colloquium

10.30 - 11.00 Coffee Break

INCUBA Science Park

11.00

Workshop and Doctorial Colloquium continues

INCUBA Science Park

ROOM 137: Interaction Design with Children with Disabilities

ROOM 147: Design for Repurposing: Rethinking Children's Interaction with Tangibles

ROOM 139: IBooC 2014: Second Workshop on Interactive e-Books for Children **ROOM 129:** Curriculum or Not – Show Us How You Teach Interaction Design and Children

ROOM 120: Doctoral Colloquium

12.30 - 13.00

Lunch

INCUBA Science Park

Lunch provided for full day Workshop participants, Doctoral Colloquium students and organizers of full day workshops and organizers.

13.00 – 15.30 Workshops, Tutorial and Doctorial Colloquium

INCUBA Science Park

ROOM 112: Tutorial: How does the interaction with digital creative tools support child development?

ROOM 121: Child-Robot Interaction: Social Bonding, Learning and Ethics

ROOM 137: Interaction Design with Children with Disabilities

ROOM 147: Design for Repurposing: Rethinking Children's Interaction with Tangibles

ROOM 139: IBooC 2014: Second Workshop on Interactive e-Books for Children

ROOM 120: Doctoral Colloquium

15.30 - 16.00 Afternoon break

INCUBA Science Park

TUESDAY

16.00 - 17.00

Workshops, Tutorial and Doctorial Colloquium

INCUBA Science Park **ROOM II2:** Tutorial: How does the interaction with digital creative tools support child development?

ROOM 121: Child-Robot Interaction: Social Bonding, Learning and Ethics

ROOM 137: Interaction Design with Children with Disabilities

ROOM 147: Design for Repurposing: Rethinking Children's Interaction with Tangibles

ROOM 139: IBooC 2014: Second Workshop on Interactive e-Books for Children

ROOM 120: Doctoral Colloquium

17.00

Informal welcome drink

INCUBA Science Park A free drink is provided for workshop organizers, workshop participants, tutorial instructors, tutorial participants, doctorial colloquium students and organizers.



Welcoming reception at ARoS Aros Allé 2, 8000 Aarhus

WEDNESDAY

07.00-07.30 Morning run Aarhus Seaside

08.15-08.45 Morning yoga Nygaard Building

08.15 Registration desk opens

Nygaard Building, Helsingforsgade 14, 8200 Aarhus N

09.00-10.30 Opening Keynote: Paulo Blikstein

Peter Bøgh Andersen Auditorium, Nygaard Building

Re-empowering powerful ideas: designers' mission in the age of ubiquitous technology

By Director of Transformative Learning Technologies Lab, Paulo Blikstein, Stanford University Session chair: Bo Stjerne Thomsen

10.30-11.00 Coffee Break

II.00-II.45 Short Paper & Demo Madness

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Anja Zeising

CamQuest: Design and Evaluation of a Tablet Application for Educational Use in Preschools Catherine Hedler; Jennie Berggren

Connecting Children To Nature with Technology: Sowing the Seeds for Pro-environmental Behaviour Bronwyn Cumbo; Jeni Paay; Jesper Kjeldskov; Brent Jacobs

Connected Messages: A Maker Approach to Interactive Community Murals with Youth

Orkan Telhan; Yasmin Kafai; Richard Davis; K-Fai Steele; Barrie Adleberg

Design and Evaluation of Interactive Musical Fruit

Cumhur Erkut; Stefania Serafin; Jonas Fehr; Henrique Mrf Figueira; Theis Boisen Hansen; Nicholas John Kirwan; Mariam Radik Zakarian

WEDNESDAY

Understanding Child-Defined Gestures and Children's Mental Models for Touchscreen Tabletop Interaction

Karen Rust; Meethu Malu; Lisa Anthony; Leah Findlater

Jigsaw Together: A Distributed Collaborative Game for Players with Diverse Skills and Preferences

Dimitris Grammenos; Antonis Chatziantoniou

ChiroBot: Modular-Robotic manipulation via Spatial Hand Gestures

Jasjeet Singh Seehra; Ansh Verma; Karthik Ramani

Affective Communication Aid using Wearable Devices based on Biosignals

Yuji Takano; Kenji Suzuki

Screen Time for Children Steven Lemay; Terry Costantino; Sheilah O'Connor; Eda Conte-Pitcher

Power Puppet: Science and Technology Education through Puppet Building

Firaz Peer; Michael Nitsche; La Schaffer

Motivating children's initiations with novelty and surprise: Initial design recommendations for autism Alyssa M. Alcorn; Helen Pain; Judith Good

MakeScape Lite: A Prototype Learning Environment for Making and Design Brian Danielak; Adam Mechtley; Matthew Berland; Leilah Lyons

Stamp-On in a Museum: Helping Children's Scientific Inquiry

Keita Muratsu; Ayako Ishiyama; Fusako Kusunoki; Shigenori Inagaki; Takao Terano

Children as Co-Researchers: More than just a role-play Fenne van Doorn; Mathieu Gielen; Pieter Jan Stappers

Considering Visual Programming Environments for Documenting Physical Computing Artifacts Eva-Sophie Katterfeldt

A Study Of Auti: A Socially Assistive Robotic Toy Helen Andreae; Peter Andreae; Jason Low; Deirdre Brown

WEDNESDAY

Design with the Deaf: Do Deaf children need their own approach when designing technology?

Leigh Ellen Potter; Jessica Korte; Sue Nielsen

Applying the CHECk tool to Participatory Design Sessions with Children

Maarten Van Mechelen; Gavin Sim; Bieke Zaman; Peggy Gregory; Karin Slegers; Matthew Horton

Low-fidelity Prototyping Tablet Applications for Children Etienne Bertou: Suleman Shahid

An Owl in the Classroom: Development of an Interactive Storytelling Application for Preschoolers Iris Soute; Henk Nijmeijer

KIKIWAKE: Participatory Design of Language Play Game for Children to Promote Creative Activity based on Recognition of Japanese Phonology

Takahiro Nakadai; Tomoki Taguchi; Ryohei Egusa; Miki Namatame; Masanori Sugimoto; Fusako Kusunoki; Etsuji Yamaguchi; Shigenori Inagaki; Yoshiaki Takeda; Hiroshi

Mizoguchi

TangiPlan: Designing an Assistive Technology to Enhance Executive Functioning Among Children with ADHD

Orad Weisberg; Ayelet Gal-Oz; Ruth Berkowitz; Noa Weiss; Oran Peretz; Shlomi Azoulai; Daphne Kopelman-Rubin; Oren Zuckerman

I 1:45-13.00 Paper session I: EMBODIED INTERACTION

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Janet C Read

Interpreting Data from Within: Supporting Human-Data Interaction in Museum Exhibits Through Perspective Taking

Roberts, J., Lyons, L., Cafaro, F. & Eydt, R. University of Illinois at Chicago Learning Sciences Research Institute, US New York Hall of Science, US

As data rather than physical artifacts become more commonly the product of modern scientific endeavor, we must at-

tend to human-data interactions as people reason about and with representations of data increasingly being presented in museum settings. Complex data sets can be impenetrable for novices, so the exhibit presented here was designed to give visitors control over a personalized "slice" of the data set as an entry point for exploration. Personalized control and collaboration can often be at odds in exhibits, however, This paper presents a study of two alternate approaches to designing an embodied interaction control for the exhibit that serves both needs. The results demonstrate that interaction design can affect children's perspective taking as they interact with a Census data map museum display, and that the perspective taken by individuals is correlated with their operation of the interactive exhibit and the kinds of reasoning they employ while investigating data.

Designing and Evaluating Touchless Playful Interaction for ASD Children

Bartoli, L., Garzotto, F., Gelsomini, M., Oliveto, L. & Valoriani, M. Politecnico di Milano, IT Associazione Astrolabio Firenze, IT

Limited studies exist that explore motion-based touchless applications for children with ASD (Autism Spectrum Disorder) and investigate their design issues and the benefits they can bring to this target group. The paper reports a structured set of design guidelines that distill our experience gained from empirical studies and collaborations with therapeutic centers. These heuristics informed the design of three touchless games that were evaluated in a controlled study involving medium functioning ASD children at a therapeutic center. Our findings confirm the potential of motion-based touchless applications games for technology-enhanced interventions for this target group.

WEDNESDAY

"Child as the Measure of all Things": The Body as a Referent in Designing a Museum Exhibit to Understand the Nanoscale

Mora-Guiard, J & Pares, N. Universitat Pompeu Fabra, SP

The nanoscale, despite being something "present" in our everyday life, is actually an abstract concept given the impossibility of having a direct perception of it. This article presents the design process and analysis of an interactive exhibit called "NanoZoom" for a temporary exhibition for the science museum of Barcelona. The goal of the exhibit was to help users understand how small objects are in the nanoscale by designing a full-body interactive experience. The hypothesis behind the design of the system was based on the idea that our body is our constant referent to allow us to understand issues of scale, proportions, distances, etc. Hence, taking the body of the user as a referent should help users better understand how small objects in the nanoscale are. The approach was based on a contemporary view on the Vitruvian Man in full-body interaction; i.e. based on modern theories that claim that

embodied interaction can foster a better learning of our environment. Experimental assessment was carried out with 64 children, comparing the full-body interactive experience with a desktop adaptation of it. Results showed better performance on children's memorability and classification of objects (ranging from the size of centimeters to the nanoscale) for those who used the full-body experience with respect to those in the desktop system.

13.00-14.30 Lunch INCUBA Science Park

14:30-16:10 Paper session 2: INTERACTING TOGETHER

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Svetlana Yarosh

WEDNESDAY

Emergent Dialogue: Eliciting Values during Children's Collaboration with a Tabletop Game for Change

Antle, A. N., Warren, J.L., May, A., Fan, M., & Alyssa, W.F. Simon Fraser University, CA

Games for Change (G4C) is a movement and community of practice dedicated to using digital games for social change . However, a common model of persuasion built into most G4C, called Information Deficit, assumes that supporting children to learn facts will result in behavior change around social issues. There is little evidence that this approach works. We propose a model of game play, called Emergent Dialogue, which encourages children to discuss their values during interaction with factual information in a G4C. We summarize a set of guidelines based on our Emergent Dialogue model and apply them to the design of Youtopia, a tangible, tabletop learning game about sustainability. Our goal was to create a game that provided opportunities for children to express and discuss their values around sustainable development trade-offs during game play. We evaluate our design using video, survey and questionnaire data. Our results provide evidence that our model and design guidelines are effective for supporting value-based dialogue during collaborative game play.

Designing Digital Peer Support for Children: Design Patterns for Social Interaction

Lindberg, S., Wärnestål, P., Nygren, J. & Svedberg, P. Halmstad University, SE

Children who have survived a life-threatening disease like cancer benefit from social support from other children with a similar background. However, these children are often geographically dispersed and have little opportunity to meet. We investigate the design and development of Digital Peer Support Services (DPS), which may overcome this problem. Peer support is a kind of social support that brings together peers with similar experiences to help their adjustment to a disease. The aim of this paper is to develop design patterns for social interaction that can be implemented in a DPS for children surviving cancer. We

conducted four sets of design workshops with children, from which emerged clusters relating to peer support and friendship that were broken down into triads. From these, six design patterns for social interaction were developed. The patterns delineate different aspects of social interaction for children and are illustrated with examples from DPS prototypes and concepts. The patterns are organized into a hierarchy, comprising the beginning of a design pattern language for social interaction for children. An essential aspect of the patterns is providing users with transparency and control of the extent to which their social interaction is public or private.

Investigating Interaction with Tabletops in Kindergarten Environments

Kammer, D., Dang, R., Steinhauf, J. & Groh, R., Technische Universität Dresden, DE, T-Systems Multimedia Solutions GmbH, DE

In this paper, we investigate interaction of children with interactive tabletops in kindergarten environments. In our understanding, such environments feature a certain degree of supervision, group play, as well as sole activities. In contrast to the traditional desktop PC workplace, interactive tabletops encourage communication and social interaction between children. In order to observe interaction and collaboration, we developed a suite of playful applications called VisMo, which we tailored to the needs and expectations of the target group. Our observational study with twelve Kindergarten children highlights pedagogical and usability aspects. We observed motivation and collaboration of the children and used a formal notation to transcribe their performed multi-touch gestures.

WEDNESDAY

Exploring Physical and Digital Identity with a Teenage Cohort

Emanuel, L. & Stanton Fraser, D. University of Bath, UK

The way we develop, use and visualize identity is rapidly evolving as research moves towards the capability to accurately link our digital and physical identities. With teenagers at the forefront of this hyper-connected world, this paper uses a systematic approach to contribute an in-depth understanding of teenagers' attitudes, values and concerns on privacy and identity information when considering both online and offline spaces. Using participatory design methods, we present three interactive workshops examining participant's perception of how their own online identities translated to the physical world, and the values and social considerations they hold around new or near-future identification techniques. We discuss how our deeper understanding of this age group's attitudes, values and concerns can be applied to designing socially acceptable identification technology and effective education on privacy and identity management among teens.

16.10-17.30 Coffee and posters Basement of the Nygaard Building (-1)

16.10-17.30 Camp coffee

Outside the Nygaard Building

18.30-20.30 Welcome reception at ARoS

ARoS Aros Allé 2, 8000 Aarhus



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Poster + Demo session II Basement of the Nygaard Building

Conference Dinner Centralværkstedet, Værkmestergade 9, 8000 Aarhus **07.00-07.30 Morning run** Aarhus Seaside

08.15-08.45 Morning yoga Nygaard Building

08.15 Registration desk opens

Nygaard Building, Helsingforsgade 14, 8200 Aarhus N

09:00-10:40 Paper session 3: DESIGNING FOR AND WITH CHILDREN

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Mona Leigh Guha

Sparkles of Brilliance: Incorporating Cultural and Social Context in Co-design of Digital Artworks

Hamidi, F., Saenz, K. & Baljko, M. York University, CA Kopalli Arte Publico, MX

Digital media have great potential as tools for self-expression and artistic exploration. We seek to enrich the discussion of challenges and benefits associated with using digital design methods and materials with children in developing countries through a case study. Our contributions to this discussion are based on our involvement in facilitating a two-day co-design workshop with 25 marginalized children in Oaxaca, Mexico. Together, we explored, designed and implemented digitally augmented paper artifacts based on traditional folk art from the children's native region. We analyzed the artworks and observed the children during the workshop to inform our research. Lessons learned include the importance of establishing trust though local contacts, incorporating relevant cultural and social elements, planning concrete outcomes and using technology appropriately. We hope that this detailed case study may serve as an exemplar, by providing insights and inspiration for other designers, researchers, and developers when planning, carrying out, and studying workshops.

Participatory Design Strategies to Enhance the Creative Contribution of Children with Special Needs

Malinverni, L., Mora-Guiard, J., Padillo, V., Mairena, M.-A., Hervás, A. & Pares, N. Universitat Pompeu Fabra, SP Hospital Sant Joan de Deu, SP

In recent years there has been an increasing awareness about the importance of involving children with special needs in the process of designing technology. Starting from this perspective, the paper presents the participatory design process carried out with children with autistic spectrum disorder for the design of a Kinect motion-based game aimed at fostering social initiation skills. By describing the strategies used for the design of the activities, we will suggest possible approaches aimed toward widening the space for contributions of children and including them at a more creative level. Within that, major emphasis will be dedicated to discussing the "empowering dimension" of participatory design activities as an instrument to enhance benefits both for design results and for the children themselves. Finally, the balance be-

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tween structure and freedom in the design of the activities will be discussed.

Play It Our Way: Customization of Game Rules in Children's Interactive Outdoor Games

Avontuur, T., de Jong, R., Brink, E., Florack, Y., Soute, I. & Markopoulos, P. Eindhoven University of Technology, NL

In traditional outdoor games, such as tag and hide-and-seek, children play in groups, and typically changes to the rules are negotiated fluidly, without disrupting the game flow. In contrast, games that are supported by interactive technology are usually rather static, not allowing for easy adaption towards the children's narrative and desired rules. We present an iterative design process in which 65 children aged 5-12 participated in different iterations, concluding with the design of GameBaker. GameBaker is an application that allows children to modify game rules for Head Up Games, outdoor collocated games supported by interactive handheld devices. We show how children: understand how setting different game rules allows them to modify the game, are able to relate these to how

the game is played, and enjoy doing so. This research paves the way towards allowing children to take control of outdoor game technology, to create their own variation of games as they have done for centuries in traditional games.

Giving Ideas an Equal Chance: Inclusion and Representation in Participatory Design with Children

Read, J., Fitton, D. & Hortton, M. University of Central Lancashire, UK

Participatory Design (PD) in various guises is a popular approach with the Interaction Design and Children (IDC) community. In studying it as a method very little work has considered the fundamentals of participation, namely how children choose to participate and how their ideas are included and represented. This paper highlights ethical concerns about PD with children within the context of information needed to consent. In helping children understand participation in PD, a central aspect is the necessity to help children understand how their design ideas are used which itself challenges researchers to seek a fair and equitable

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process that is describable and defensible. The TRAck (tracking, representing and acknowledging) Method, is described as an initial process that could meet this need. This is evaluated, in two forms, in a PD study with 84 children. The TRAck Method encouraged careful scrutiny of designs and allowed the researchers to distil useful design ideas although these were maybe not the most imaginative. There is a trade off between the limitations of applying such a process to PD against the benefits of ensuring full-informed involvement of children.

10.40-11.00 Coffee Break

II.00-II.45: Short paper and demo Madness

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Christopher Frauenberger

Detecting Handwriting Errors with Visual Feedback in Early Childhood for Chinese Characters

Wai Wa Will Tang; Hong-Va Leong; Chi Fai Stephen Chan; Grace Ngai Adapting Design Probes to explore health management practices in pediatric type I diabetes Damyanka Tsvyatkova; Cristiano Storni

Design Guidelines for More Engaging Electronic Books: Insights from a Cooperative Inquiry Study Luca Colombo; Monica Landoni; Elisa Rubegni

Do interactions speak louder than words? Dialogic reading of an interactive tablet-based e-book with children between 16 months and three years of age Kasper Boldreel; Niklas Ammitzbøll Rasmussen; Anders Etzerodt Salling Pedersen; Joachim Lykke Østergaard Olesen; Hendrik Knoche

Building an Internet of School Things Ecosystem – a National Collaborative Experience

Chris Joyce; Han Pham; Danae Stanton Fraser; Stephen Payne; David Crellin; Sean McDougall

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Exploring Challenging Group Dynamics in Participatory Design with Children

Maarten Van Mechelen; Mathieu Gielen; Vero Vanden Abeele; Ann Laenen; Bieke Zaman

ExciteTray: Developing an Assistive Technology to Promote Self-Feeding Among Young Children

Ayelet Gal-Oz; Orad Weisberg; Tal Keren-Capelovitch; Yair Uziel; Ronit Slyper; Patrice L.Tamar Weiss; Oren Zuckerman

Understanding and Fostering Children's Storytelling During Game Narrative Design

Laura Benton; Asimina Vasalou; Daniel Gooch; Rilla Khaled

Interactive and Live Performance Design with Children

Karen Rust; Elizabeth Foss; Elizabeth Bonsignore; Brenna McNally; Chelsea Hordatt; Meethu Malu; Bie Mei; Hubert Kofi Gumbs

Designing digital media for creative mathematical learning

Chronis Kynigos; Foteini Moustaki

Craft, click and play: crafted video-games, a new approach for physical-digital entertainment Jesus Ibanez Martinez

Head Mounted Displays and Deaf Children: Facilitating Sign Language in Challenging Learning Environments Michael Jones; Jeannette Lawler; Eric Hintz; Nathan Bench; Fred Mangrubang; Mallory Trullender

3D Printed Tactile Picture Books for Children with Visual Impairments: A Design Probe Abigale Stangl; Jeeeun Kim; Tom Yeh

Meta-Designing Interactive Outdoor Games for Children: A Case Study.

Susanne Lagerström; Iris Soute; Yves Florack; Panos Markopoulos

The Effect of Visual Contextual Structures on the Children's Imagination in Story Authoring Interfaces Sharon Lynn Chu; Francis Quek

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Towards a Constructively Aligned Approach to Teaching Interaction Design & Children Eva Eriksson; OlofTorgersson

Using Digital Game as Clinical Screening Test to detect Color Deficiency in Young Children

Linh Chi Nguyen; Weiquan Lu; Ellen Yi-Luen Do; Audrey Chia; Yuan Wang

SmartHolder: Sensing And Raising Families' Awareness Of Tooth Brushing Habits

Ana Caraban; Maria José Ferreira; Vítor Belim; Olga Lyra; Evangelos Karapanos

Action! Designing Interactive Technology with Immigrant Teens

Karen Fisher; Ann Bishop; Lassana Magassa; Phil Fawcett

RaBit EscApe: A Board Game for Computational Thinking

Panagiotis Apostolellis; Michael Stewart; Chris Frisina; Dennis Kafura FabCode:Visual Programming Environment for Digital Fabrication Harshit Agrawal; Rishika Jain; Prabhat Ku-

mar; Pradeep Yammiyavar; Vishesh Kumar

Frog Pond: A Code-First Learning Environment on Evolution and Natural Selection Mike Horn; Corey Brady; Arthur Hjorth;

Aditi Wagh; Uri Wilensky

11:45-13.00 Paper session 4: CRAFTING INTERACTIONS

Peter Bøgh Andersen Auditorium, Nygaard Building Session chair: Narcís Parés

Incorporating Peephole Interactions into Children's Second Language Learning Activities on Mobile Devices

McNally, B., Guha, M., L., Norooz, L., Rhodes, E. & Findlater L University of Maryland, US

Physical movement has the potential to enhance learning activities. To investigate how movement can be incorporated into

children's mobile language learning, we designed and evaluated two versions of a German vocabulary game called Scenic Words. The first version used movement-based dynamic peephole navigation, which requires physical movement of the arms, while the second version used touch-based static peephole navigation, which only requires standard touchscreen interactions; static peepholes are the status quo interaction technique for navigation, commonly found, for example, in map applications and games. To compare the two types of navigation and to assess children's reactions to dynamic peepholes, we conducted an in-home study with 16 children (ages 8–9). The children participated in pairs but individually played each version of the game on a mobile device. While results showed that the more familiar static peepholes were the preferred interaction style overall, participants became accustomed to the movement-based dynamic peepholes during the study. Participants noted that the dynamic peephole interaction became easier over time, and that it had some advantages such as for dragging-and-dropping elements in the game.

Search Result Visualization with Characters for Children

Gossen, T., Müller, R., Stober, S. & Nürnberger, A. Otto-von-Guericke University Magdeburg, DE

In this paper, we explore alternative ways to visualize search results for children. We propose a novel search result visualization using characters. The main idea is to represent each web document as a character where a character visually provides clues about the webpage's content. We focused on children between six and twelve as a target user group. Following the user-centered development approach, we conducted a preliminary user study to determine how children would represent a webpage as a sketch based on a given template of a character. Using the study results the first prototype of a search engine was developed. We evaluated the search interface on a touchpad and a touch table in a second user study and analyzed user's satisfaction and preferences.

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A Diary Study of Children's User Experience with EBooks Using Flow Theory as Framework

Colombo, L. & Landoni, M. University of Lugano, CH

This paper describes a diary study aimed at evaluating the User Experience (UX) of 7 to 12 years old children when interacting with eBooks. The goal was to understand whether, in a context of leisure reading, enhanced eBooks provide a better reading experience than basic eBooks. We took inspiration from Csikszentmihalyi's Flow theory to define a benchmark for evaluating the reading experience, and then - by means of the Experience Sampling Method (ESM) and an adapted version of the Flow Short Scale (FKS) - we investigated and collected data on the reading experience of two groups of children: one group read an enhanced eBook while the other read a basic version of the same eBook. Following a mixed-method approach, with quantitative analysis we verified whether participants who read the enhanced eBook had a better reading experience, while with qualitative analysis we tried to

understand why. The results showed that interactive and multimedia enrichments (read-aloud narration in particular) had a positive effect on children's experience with the enhanced eBook.

13.00-14.30: Lunch INCUBA Science Park

14:30-16:10 Paper session 5: APPLICATIONS FOR LEARNING

Peter Bøgh Andersen Auditorium, Nygaard Building Chris chair: Chris Quintana

Waiting for Learning - Designing Interactive Education Materials for Patient Waiting Areas

Leong, Z. A. & Horn, M. Northwestern University, US

We describe the research and design of educational media for children in doctor's office waiting areas. Even though technology use for medical purposes has become increasingly prominent for doctors, admin-

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istration, and patients, research on the use of interactive technology for health education is limited. In this project, we focus on clinics for Sickle Cell Disease treatment. These clinics treat patients of various ages and disease severity, but all patients make frequent, recurring visits for treatments and checkups. We describe our current research to better understand the behaviors and activities of patients as they wait in the clinic, their expectations and understandings of Sickle Cell Disease and its treatment, the educational material currently available, and our preliminary methods for developing interactive technologies for these environments. This reseach includes observations in pediatric clinic waiting areas, interviews with clinic staff, and preliminary user testing with our interactive designs.

"It helped me do my science." - A Case of Designing Social Media Technologies for Children in Science Learning

Yip, J. C. Ahn, J., Clegg, T., Bonsignore, E., Pauw, D. & Gubbels, M University of Maryland, US

In this paper, we present the design evolution of two social media (SM) tools: Scientific INQuiry (SINQ), which transformed into ScienceKit We detail our motivations for using SM tools in science learning and the design decisions we made over a 2-year, design-based research project. Our designs grew from our experiences using SM tools in the field and co-designing these systems with children. Our longitudinal case study and design narrative contribute to our understanding of the design and use of SM tools to support children's scientific inquiry. Specifically, we detail (1) the affordances and constraints we gleaned from the design evolution of SINQ to ScienceKit, (2) the potential of SM to guide learning behaviors, and (3) the role of SM for children and the community of adults and peers who support them.

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Fiabot! Design and Evaluation of a Mobile Storytelling Application for Schools

Rubegni, E. & Landoni, M. University of Lugano, CH

This paper contributes to the ongoing debate about how digital technology can be integrated into the formal education system. Within a longitudinal research study, which lasted four years, we conducted an investigation on how mobile technology can support educational activities as defined by a school curriculum. Among the topics included in the school curriculum, we focused on the literary field and developed a Digital StoryTelling (DST) application, Fiabot!, to support this activity. Here, we describe the design of the application and how we evaluated its impact on educational activities. The application was designed and evaluated in two primary schools. The study had the objectives of exploring whether Fiabot! supports children in achieving educational objectives defined by the curriculum, how this effectively supports teachers, and to what extent children like using it for the creation and sharing of their stories. Our findings show that the

application has a positive impact on curriculum enactment and effectively supports the related educational activities. Overall, Fiabot! wasdemonstrated to be very effective in stimulating children's discussion of a story's plot and characters. Thus, Fiabot! supported children not only in being creative but also in organizing their work and exploring a digital media opportunity. This resulted in the development of new skills and the better grounding of previously acquired knowledge, while teachers also had the opportunity to expand their teaching skills and get a taste of ICT's potential in education.

THURSDAY

Shake up the Schoolyard: Iterative Design Research for Public Playful Installations

Tieben, R., de Valk, L., Rijnbout, P., Bekker, T. & Schouten, B. Eindhoven University of Technology, NL Fontys University of ICT, NL

Three different design research topics are presented in this article: how to design social and active play for teenagers, how to design for open-ended and emergent play, and how to evaluate interactive playful installations in situ. The Wiggle the Eye installation, five interactive wiggle benches and a central lamp, was iteratively developed and evaluated with more than 1000 users, at two high schools, one university and a design festival. The installation succeeded in inviting teenagers to play in a social way, yet the interaction design proved challenging: uncoordinated mass usage and a variety of external factors influenced the exploration and discovery process for the users. The presented insights serve as advice for everyone designing for teenagers, public spaces or playful interactions.

16.10-17.30 Coffee and posters Basement of the Nygaard Building

16.10-17.30 Camp coffee Outside the Nygaard Building

19.00-24.00 Conference Dinner

at Centralværkstedet Værkmestergade 9, 8000 Aarhus C



Busses depart for Billund



Busses return to Aarhus

8.00 Bus DEPARTURE from Musikhuset Aarhus

Thomas Jensens Alle 2, 8000 Aarhus C. Tour from Aarhus to LEGO[®] Headquarter, Billund. Last bus departs at 8.00.



10.00-10.15 Welcome

Tina Holm Sorensen, Research Officer, The LEGO[®] Foundation

Ole Sejer Iversen, Professor, Aarhus University

FRIDAY



10.15-11.00 Closing Keynote: Marilyn Fleer

Young children's use of creative tools - The demands and motives afforded through digital play in early childhood activity settings

By Professor Marilyn Fleer, Monash University Session chair: Bieke Zaman

II.I5-I2.45 ROUND I: Fora Groups/ Tour to LEGO[®] IDEA House/ LEGO[®] Factory

Facilitated by groups from The LEGO[®] Group and The LEGO[®] Foundation

I3.00-I4.30 ROUND II: Fora Groups/ Tour to LEGO® IDEA House/ LEGO® Factory

Facilitated by groups from The LEGO[®] Group and The LEGO[®] Foundation 14.30-15.00 Coffee Break

15.00-16.00 Closing Panel

Session chair: Mitch Resnick Chief Futurist Dr. Allison Druin (University of Maryland) Director of Transformative Learning Technologies Lab Paulo Blikstein (Stanford University) Professor Marilyn Fleer (Monash University) Professor Janet Read, (University of Central Lancashire) Director Bo Stjerne Thomsen (The LEGO® Foundation)

16.00-16.15 Goodbye

Bo Stjerne Thomsen, Director, The LEGO® Foundation Ole Sejer Iversen, Professor, Aarhus University

16.30

Bus departure from Billund to Aarhus







Nygaard Building



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