

# Dr. Julie Wagner

Creative Technologist, Interaction Engineer

Name	Julie Wagner
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Web	juliewagner.net
Date of Birth	09.06.1983 in Hannover

## Professional Experience

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Since July 2015

Senior User Experience Specialist,  
Fujitsu

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June 2013 - June 2015

Post-Doc,  
Ludwig-Maximilians Universität

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October 2012 - April 2013

Post-Doc,  
Télécom ParisTech, Paris

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September 2009 - September 2012

PhD in Interaction Design (Computer Science)  
INRIA, Université Paris Sud  
Title: Philosophiae doctor, Très Honorable

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May 2009 - August 2009

Internship, Insitu Research Group  
INRIA, Université Paris Sud

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September 2002 - March 2009

Computer Science, RWTH-Aachen  
Title: Diplom Informatikerin (Note: sehr gut)

## IoT Projects

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CrowdView, Roskilde 2016 (supported by IBM) - Pet Project

Using Bluemix services, we collected 65 Mio anonymized geo-locations over 8 days by 40.000 unique attendees of the Roskilde Festival 2016. Using a user-centered approach, we collaborated with safety-manager Sofie Dahl to iteratively implement a support tool visualizing the crowd and pedestrian flow at the festival.

The WALL Room, Paris

The WALL room features a high-resolution wall-sized display to visualize large data sets. I worked with astrophysicists, who provided large telescope images (e.g. of the milky-way). We co-designed several interaction techniques for collaborative data exploration using tablets, notebooks and self-build gadgets (e.g. gloves for mid-air gesture interaction).

## Skills

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Languages

English and French (fluid)  
Spanish (advanced)

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Programming

Objective-C, iOS  
Java, Android, Python  
HTML, PHP, Javascript (DOM, d3.js, three.js),  
MongoDB, Express, AngularJS, NodeJS)  
Polymer

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Prototyping

Arduino, Laser cutting, 3D printing

# Recent Projects - supported by IBM

Roskilde Festival 2016:  
CrowdView - Crowd-safety  
Managers  
Redirecting Pedestrian's Flow  
crowdview.dk



In June 2016, we created <https://crowdview.dk> - more than 30.000 people provide anonymous location data at the Roskilde Festival in Denmark.

Each year, the Roskilde Festival invites about 130.000 people to join the 8 day festival featuring art installations, crowd-organized activities and music. The entire festival area is divided into 71 campsites, stages and parking areas, each managed by safety managers and their team.

Following a user-centered approach, Sofie Dahl, crowd-safety manager at Roskilde festival, co-designed CrowdView with us and continuously provided feedback on the user Interface and contributed many user-stories.

As reported by Sofie, CrowdView came in handy in their work, - E.g. when she coordinated the crowd flow between the orange and arena stage (see figure 1). As the responsible officer in the area had already seen some challenges with the way the audience filled up the front of stage area, CrowdView provided an extra dimension to the understanding of the crowds placement in the area.

CrowdView gave the control room a excellent overview on how the Arena area started to get irregularly filled on the left side but not on the right side. In order to fill up the space on the other side of the stage, the flow of people was directed out of the inner field and back in via a gate that had more capacity and into an area with more space. This was set in motion via the crowd safety personnel on the floor, and the control room could help with the situation.

CrowdView supported the control center in getting a sense of the crowd's motion from above and dynamically coordinate with the responsible field officers to change the pedestrian flow in the area.

#### Reference:

<http://www.computerworld.dk/art/237506/saa-vild-er-dataindsamlingen-paa-roskilde-festival-selv-dit-toiletbesoeg-bliver-logget>



figure 1: Crowd-managers change pedestrian's flow



figure 2: CrowdView setup in control room.

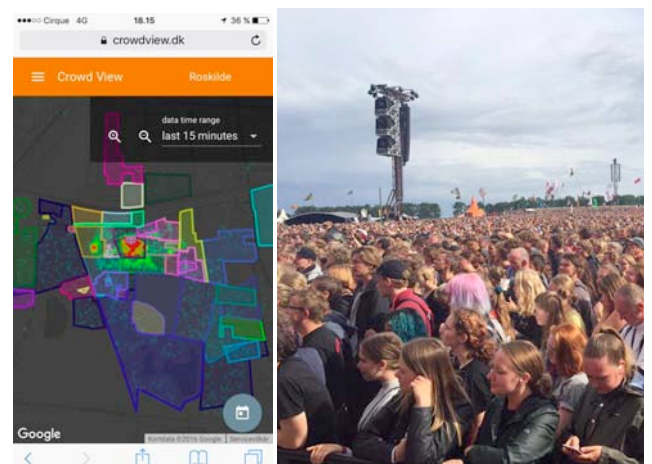


figure 3: left - CrowdView visualization on mobile phone, right - the crowd in front of orange stage.

# Selected Scientific Projects

## Master thesis:

**SLAP: Silicone Illuminated Active Peripherals**  
September 2008 - March 2009

<http://hci.rwth-aachen.de/slap>



**Silicone iLluminated Active Peripherals (SLAP)** is a system of tangible, translucent widgets for use on multitouch tabletops. SLAP Widgets are cast from silicone or made of acrylic, and include sliders, knobs, keyboards, and buttons. They add tactile feedback to multi-touch tables, improving input accuracy. Using rear projection, SLAP Widgets can be relabeled dynamically, providing inexpensive, battery-free, and untethered augmentations. Furthermore, SLAP combines the flexibility of virtual objects with physical affordances.

In the context of this project, I created the SLAP widgets from transparent material, enabled their detection on an interactive table and wrote several example applications for SLAP.

### Publications:

Weiss M., **Wagner J.**, Jennings R., Jansen Y., Khoshabeh R., Hollan J., Borchers J.  
*SLAPbook: tangible widgets on multi-touch tables in groupware environments*,  
In proc. of TEI '09

Weiss, M., **Wagner, J.**, Jennings R., Jansen Y., Khoshabeh R., Hollan J., Borchers J.  
*SLAP widgets: bridging the gap between virtual and physical controls on tabletops*,  
CHI '09 (161 citation)

## PhD Thesis:

**Wall-sized Interaction with Large Datasets**  
September, 2009 - September 2012

<http://insitu.lri.fr/Projects/WILD>




The WILD (wall-sized interaction with large datasets) room serves as a testbed for exploring the next generation of interactive systems by distributing interaction across diverse computing devices, enabling multiple users to easily and seamlessly create, share, and manipulate digital content.

As PhD student, I developed several interaction techniques for *pan-and-zoom* navigation in large data sets, e.g. giga-pixel images of the Milky way. I developed bi-manual interaction techniques for tablets (<http://insitu.lri.fr/Bipad/Bipad>) and created a *body-centric* model for describing and systematically comparing several interaction techniques.

Based on findings in user-centered workshops with biologists and astrophysicists, we analyzed their needs in current work with their data and designed novel interaction techniques for the WILD platform.

### Publications:

Honorable Mention  
 **Wagner, J.**, Nancel, M., Gustafson, S., Huot, S., Mackay, W.,  
*A Body-centric Design Space for Multi-surface Interaction*. In Proc. of CHI 2013.

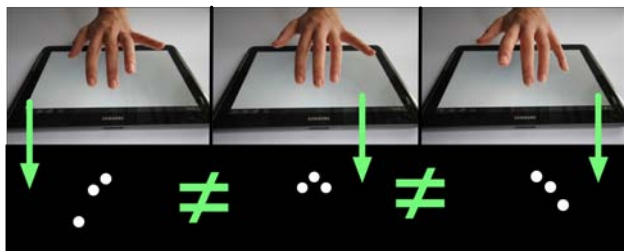
**Wagner, J.**, Mackay W., Huot, S.  
*Left-over Windows Cause Window Clutter... But What Causes Left-over Windows?* Ergo'IHM 2012

**Wagner J.**, Huot, S., Mackay, W.  
*BiTouch and BiPad: designing bimanual interaction for hand-held tablets*. In proc. of CHI '12

Beaudouin-Lafon, M., Chapuis O., Eagan, J., Gjerlufsen, T., Huot S., Klokose, C., Mackay, W., Nancel, M., Pietriga, E., Pillias, C., Primet, C., **Wagner, J.**  
*Multisurface Interaction in the WILD Room, Computer*

 Best Paper  
Nancel M., **Wagner J.**, Pietriga E., Chapuis O., Mackay W. *Mid-air pan-and-zoom on wall-sized displays*. In Proc. CHI 2011 (108 citations)

Post-Doc, Télécom ParisTech  
Finger-identification on Off-the-shelf Tablets  
October, 2012 - April 2013  
<http://www.medien.ifi.lmu.de/MultiFingerChord>



Despite the demonstrated benefits of multi-finger input, today's gesture vocabularies offer a limited number of postures and gestures. Previous research designed several posture sets, but does not address the limited human capacity of retaining them. I implemented a multi-finger chord vocabulary introducing a novel hand-centric approach to detect the identity of fingers on off-the-shelf hand-held tablets.

In a controlled cognition study (between-subjects design), I compared 'random' to a 'categorized' chord-command mappings and found that users retained categorized mappings more accurately over one week than random ones. In response to the logical posture-language structure, people adapted to logical memorization strategies, such as 'exclusion', 'order', and 'category', to minimize the amount of information to retain. I conclude that structured chord-command mappings support learning, short-, and long-term retention of chord-command mappings.

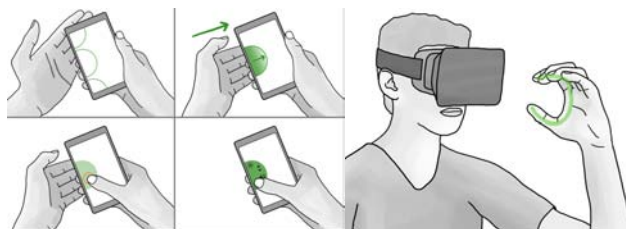
**Publikation:**



Honorable Mention  
**Wagner J.**, Lecolinet E., Selker T.  
*Multi-finger Chords for Hand-held Tablets: Recognizable and Memorable.*  
In Proc. CHI 2014.

## Supervised Projects

Post-Doc, Ludwig-Maximilians Universität  
Facilitating Learning of Mid-air Hand Poses  
June, 2013 - June 2015  
Supervising master student Simon Ismail



In the context of this Project, I supervised and instructed the student Simon Ismail. He developed an application for Android that enables the detection of freehand gestures behind an off-the-shelf phone via the build-in camera.



Mid-air gestures are defined by an initial hand pose and a subsequent movement. Existing gesture guides facilitate learning of continuous movements. Apart from cheat sheets, however, we lack a way of communicating initial hand poses. MATCH and MIME are two interaction concepts that take advantage of on-screen command representations (widgets, icons, or command names) to reveal how a complex hand pose is formed and to teach pose-command mappings. We implemented these concepts for off-the-shelf mobile phones, based on mid-air back-of-device interaction combined with on-screen touch. We ran three experiments: (1) MATCH is immediately usable without prior explanation. (2) Performance with MATCH is comparable to on-screen menu navigation for items in menu level two or deeper. (3) With MIME users learn a pose-command vocabulary faster when feedforward cues are embedded in command icons instead of names, and correctly recall significantly more poses with iconic mnemonics compared to a no-cue baseline.

**Publikation:**

Ismail S., **Wagner J.**, Selker T., Butz A.  
*Match&Mime: Facilitate Learning of Mid-air Hand Poses*, In Proc. MobileHCI'15

Post-Doc, Ludwig-Maximilians Universität  
Towards Novel Interfaces for Camera Motion  
Supervising PhD student Axel Hösl



When watching a movie, the viewer perceives camera motion as an integral movement of a viewport in a scene. Behind the scenes, however, there is a complex and error-prone choreography of multiple people controlling separate motion axes and camera attributes. This strict separation of tasks has mostly historical reasons, which we believe could be overcome with today's technology. We revisit interface design for camera motion starting with ethnographic observations and interviews with nine camera operators. We identified seven influencing factors for camera work and found that automation needs to be combined with human interaction: Operators want to be able to spontaneously take over in unforeseen situations. We characterize a class of user interfaces supporting (semi-)automated camera motion that take both human and machine capabilities into account by offering seamless transitions between automation and control.

We work on the technical implementation of several concepts we developed for this novel type of *cooperative automation*. In order to enable that camera operators can take-over control when required, we believe that the automated decision-making of machines needs to be made *transparent* to users in order to gain trust in the delegation of tasks to a machine.

**Publikation:**

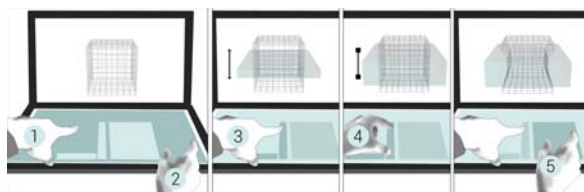
Hoesl A., Wagner, J., Butz, A.  
**Delegation Impossible? - Towards Novel Interfaces for Camera Motion**  
Extended Abstracts at CHI'15.

Post-Doc, Ludwig-Maximilians Universität  
Finger Aided Design:  
Multi-touch techniques for 3D Polygon  
Modeling  
Supervising PhD student Henri Palleis

3D modeling is a frequent task for creating animations, games or products. Most 3D authoring tools enable modeling via keyboard and mouse resulting in significant overhead; mode management, menu navigation and small manipulators generate a sequential performance. Existing research explored 3D positioning, rotation, and navigation using touch input.

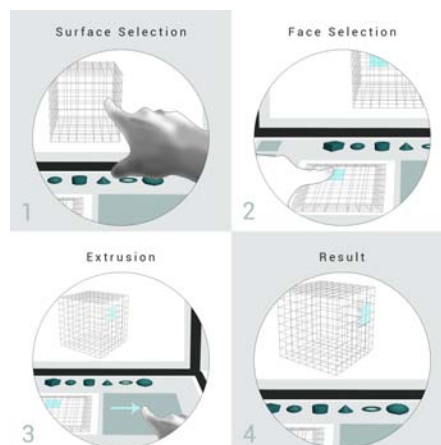
With *Finger Aided Design* (FAD), we implemented two techniques for polygon modeling tasks. Users manipulate 3D object-shapes by scaling edge-loops and extruding selected polygons using their fingers and both hands.

For edge-loop scaling, right-handed users control a selection volume's size and position with their left hand and scale the edges within using their right hand.



Edge-loop scaling Process: resize and position selection volume with left hand, scale edges within using the right hand.

Extrusion introduces a novel approach of *perspective-dependent* control: users control the scene's orientation with the left hand and implicitly control the interpretation of gestures performed with the right hand: depending on the scene's perspective, the gestures pull polygons out of the model into the respective direction.



Extrusion Process: select polygons, adjust perspective to the scene, extrude the polygons in dependence to the scene perspective

**Publikation:**

Palleis, H. , Wagner, J., Hussman H. **Finger Aided Design (FAD): Multi-touch Techniques for 3D Polygon Modeling**. Extended Abstracts UIST 2015

# Awards - Publications - Scientific Activities

## Awards

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### Best Paper Award (top 1%)



#### 2011 Mid-air pan-and-zoom on wall-sized displays (108 Citations)

Mathieu Nancel, **Julie Wagner**, Emmanuel Pietriga, Olivier Chapuis, Wendy Mackay  
In Proceedings of CHI'11, the 29th ACM International Conference on Human Factors in Computing Systems,

### Honorable Mention (top 5%)



#### 2014 Multi-finger Chords for Hand-held Tablets: Recognizable and Memorable (8 Citations)

**Julie Wagner**, Eric Lecolinet, Ted Selker  
In Proceedings of CHI'14, the 32nd ACM International Conference on Human Factors in Computing Systems.

#### 2013 A Body-centric Design Space for Multi-surface Interaction (34 Citations)

**Julie Wagner**, Mathieu Nancel, Sean Gustafson, Stéphane Huot, Wendy Mackay  
In Proceedings of CHI'13, the 31st ACM International Conference on Human Factors in Computing Systems.

## List of publications

2 Journal papers, 12 conference papers, 2 extended abstracts

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#### 2015 Contact-analog Warnings on Windshield Displays promote Monitoring the Road Scene

Renate Häuslschmid, Laura Schnurr, **Julie Wagner**, Andreas Butz  
In Proceedings of the 7th International Conference on Automotive User Interfaces and Interactive Vehicular Applications,

#### Perspective-dependent Indirect Touch Input for 3D Polygon Extrusion

Henri Palleis, **Julie Wagner**, Heinrich Hussmann  
In Extended Abstracts of the 28th ACM User Interface Software and Technology Symposium, UIST'15,

#### Quantifying Object- and Command-oriented Interaction

Alix Goguey, **Julie Wagner**, Gery Casiez  
In Proceedings of Interact'15, the 15th International Conference on Human-Computer Interaction,

## MIME: Teaching Mid-Air Pose-Command Mappings

Simon Ismail, **Julie Wagner**, Ted Selker, Andreas Butz

In Proceedings of MobileHCI'15, the 17th International Conference on human-computer interaction with mobile devices and services

## Delegation Impossible? - Towards Novel Interfaces for Camera Motion,

Axel Hoesl, **Julie Wagner**, Andreas Butz

In Extended Abstracts of CHI'15, the 33rd SIGCHI Conference on Human Factors in Computing Systems,

## 2014 Multi-finger Chords for Hand-held Tablets: Recognizable and Memorable

**Julie Wagner**, Eric Lecolinet, Ted Selker

In Proceedings of CHI'14, the 32nd SIGCHI Conference on Human Factors in Computing Systems.

## Out of Shape, Out of Style, Out of Focus: Wie sich Computer besser in unserem Alltag Integrieren (lassen)

Andreas Butz, Gilbert Beyer, Alina Hang, Doris Hausen, Fabian Hennecke, Felix Lauber, Sebastian Loehmann, Henri Palleis, Sonja Rümelin, Bernhard Slawik, Sarah Tausch, **Julie Wagner**, Heinrich Hussmann

In Informatik Spektrum: Organ der Gesellschaft für Informatik e.V. und mit ihr assoziierte Organisationen.

## 2013 A Body-centric Design Space for Multi-surface Interaction (34 Citations)

**Julie Wagner**, Mathieu Nancel, Sean Gustafson, Stéphane Huot, Wendy Mackay

In Proceedings of CHI'13, the 31rd SIGCHI Conference on Human Factors in Computing Systems.

## 2012 Left-over Windows Cause Window Clutter, But what Causes Left-over Windows?

**Julie Wagner**, Wendy Mackay, Stéphane Huot

In Proceedings of ERGO'IHM 2012, 24th French Speaking Conference on Human-Computer Interaction

## BiTouch and BiPad: designing bimanual interaction for hand-held tablets (52 Citations)

**Julie Wagner**, Stéphane Huot, Wendy Mackay

In Proceedings of CHI'12, SIGCHI Conference of Human Factors in Computing Systems

## Multi-surface Interaction in the WILD Room

M. Beaudouin-Lafon, O. Chapuis, J. Eagan, T. Gjerlufsen, S. Huot, C. Klokmoose, W. Mackay, M. Nancel, E. Pietriga, C. Pillas, R. Primet, J. Wagner

Computer (Volume: 45, Issue: 4)

## 2011 Mid-air pan-and-zoom on wall-sized displays (108 Citations)

Mathieu Nancel, **Julie Wagner**, Emmanuel Pietriga, Olivier Chapuis, Wendy Mackay

In Proceedings of CHI 2011, 29th ACM International Conference of Human Factors in Computing Systems.

## 2010 Exploring sustainable design with reusable paper

**Julie Wagner**, Wendy Mackay

In Proceedings of CHI 2010, 28th ACM International Conference of Human Factors in Computing Systems.

## 2009 SLAPbook: tangible widgets on multi-touch tables in groupware environments

Malte Weiss, **Julie Wagner**, Roger Jennings, Yvonne Jansen, Ramsin Khoshabeh, James Hollan, Jan Borchers

TEI 2009, in Proceedings of the 3rd International Conference on Tangible and Embedded Interaction.

## SLAP widgets: bridging the gap between virtual and physical controls on tabletops (161 Citations)

Malte Weiss, **Julie Wagner**, Roger Jennings, Yvonne Jansen, Ramsin Khoshabeh, James Hollan, Jan Borchers

In Proceedings of CHI 2009, the 27th International Conference on Human Factors in Computing Systems.

# Scientific Activities

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## Program Committee Member

Interactive Tabletops and Surfaces (ITS) 2014 PC Member for Posters

IEEE Information Visualization 2014 PC Member for the Art track

## Chair

Poster Chair for Mensch und Computer 2015

Student Volunteer Chair for Tangible, Embedded, and Embodied Interaction 2014

## Jury

Member of the Workshop Jury at CHI 2014

Member of the Student Competition Jury at CHI 2014

## Other

Organizer of the ACM Special Interest Group Paris from May 2010 - May 2012