



# Crowd-powered Creativity Support

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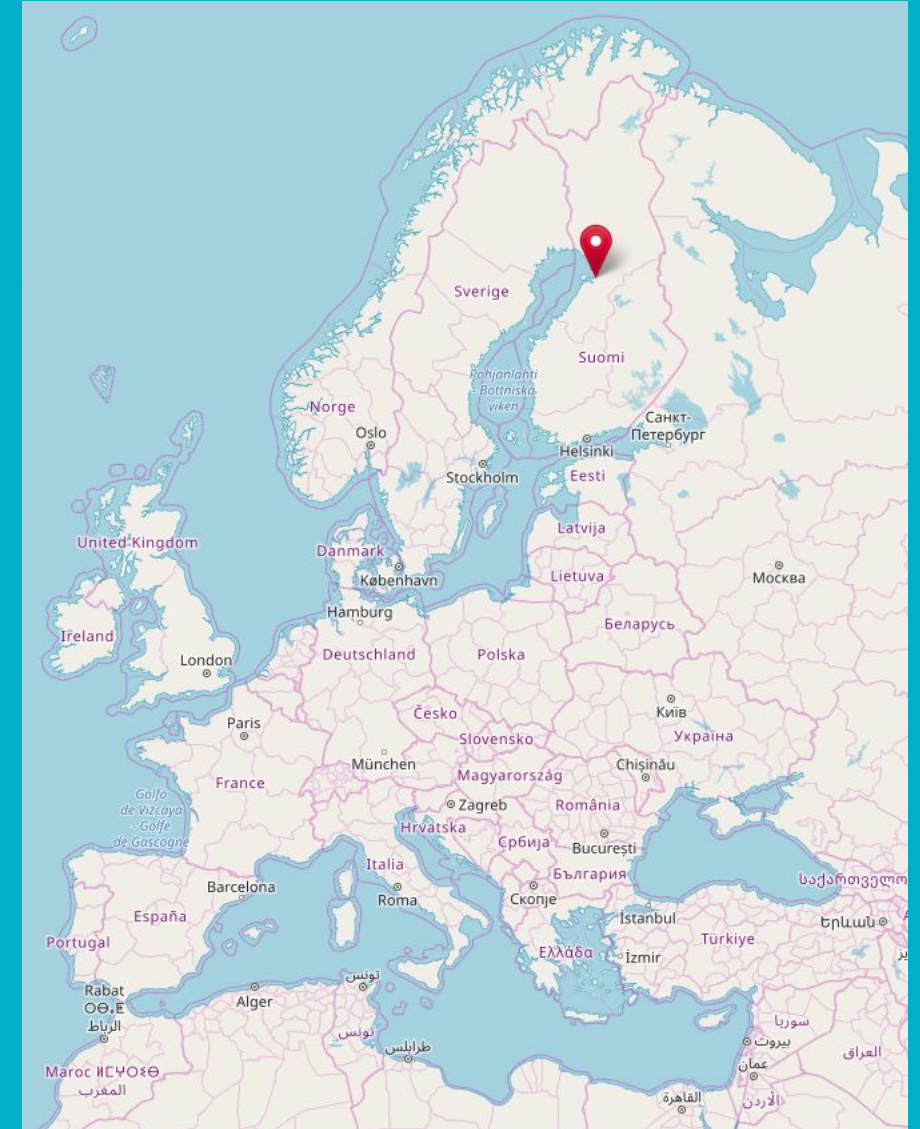


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Computer Science and Engineering

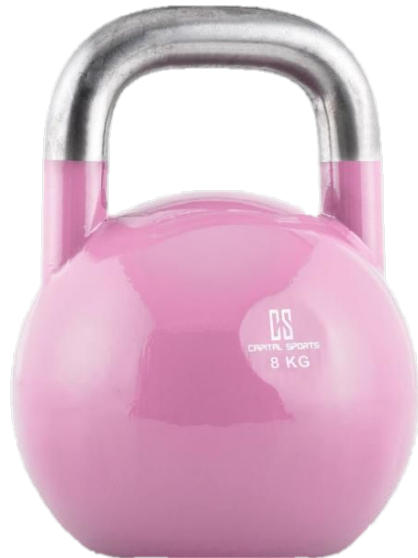
- seit 2018      University of Oulu, Finland
- 2016 - 2018    Wissenschaftlicher Mitarbeiter,  
Freie Universität Berlin und  
Humboldt Universität zu Berlin
- 2014 - 2015    Master of Science in Computer Science  
University of Southampton
- 2011            Diplom-Wirtschaftsingenieur  
Technische Universität Darmstadt



# PhD Status



1 journal  
article



3  
conference papers article



1 manuscript

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# The Broad Picture

Künstliche Intelligenz (KI)

Kreativität

*Humans as first-class citizens in  
future value chains and complex  
systems*



# Crowdsourcing



**Workers**



**Platform**



**Requesters**

*General-purpose  
paid crowdsourcing  
platforms*

**amazon**  
beta  
mechanical turk

 **Prolific**

## Examples of task instructions

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*“Come up with birthday messages for Mary, a firefighter who is about to turn 50”*

*“How can you dry many cups quickly so that they don’t take up too much space [...]?”*

*“Draw a sheep facing left” or “Please design a chair for children”*

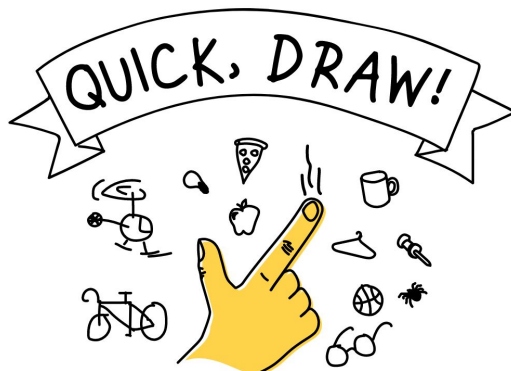
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*“[...] think of as many unique and unusual uses for a common object”*

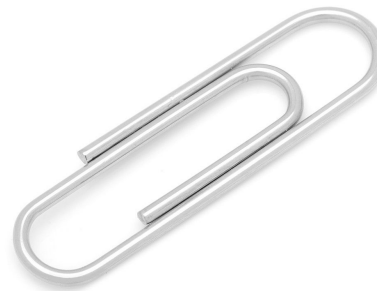
*“find a word that [is] logically linked to the set of three words”*

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## Creative tasks



## Creativity tests



# Perspektive des Crowd Workers

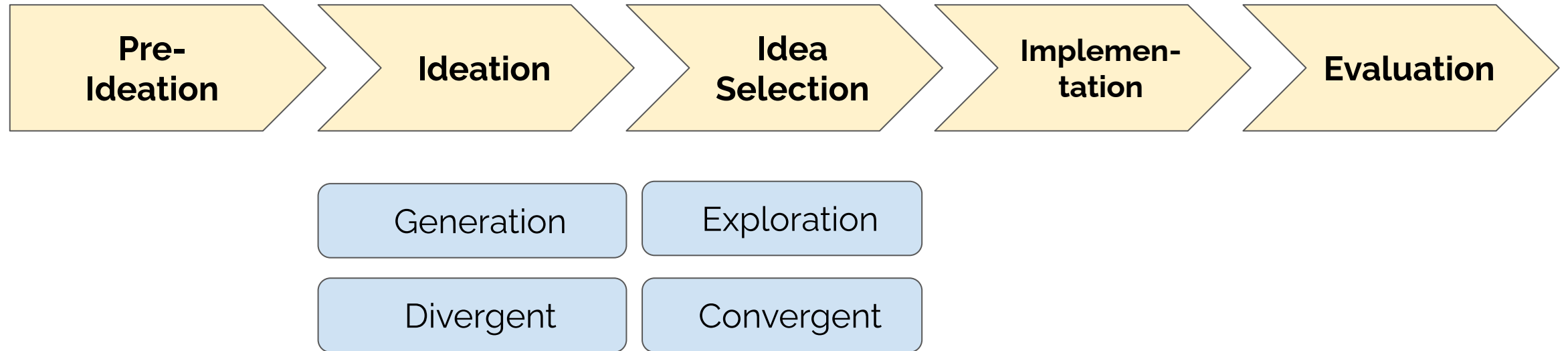


“We tried crowdsourcing the data, but the crowd threw bogus data at us instead.”



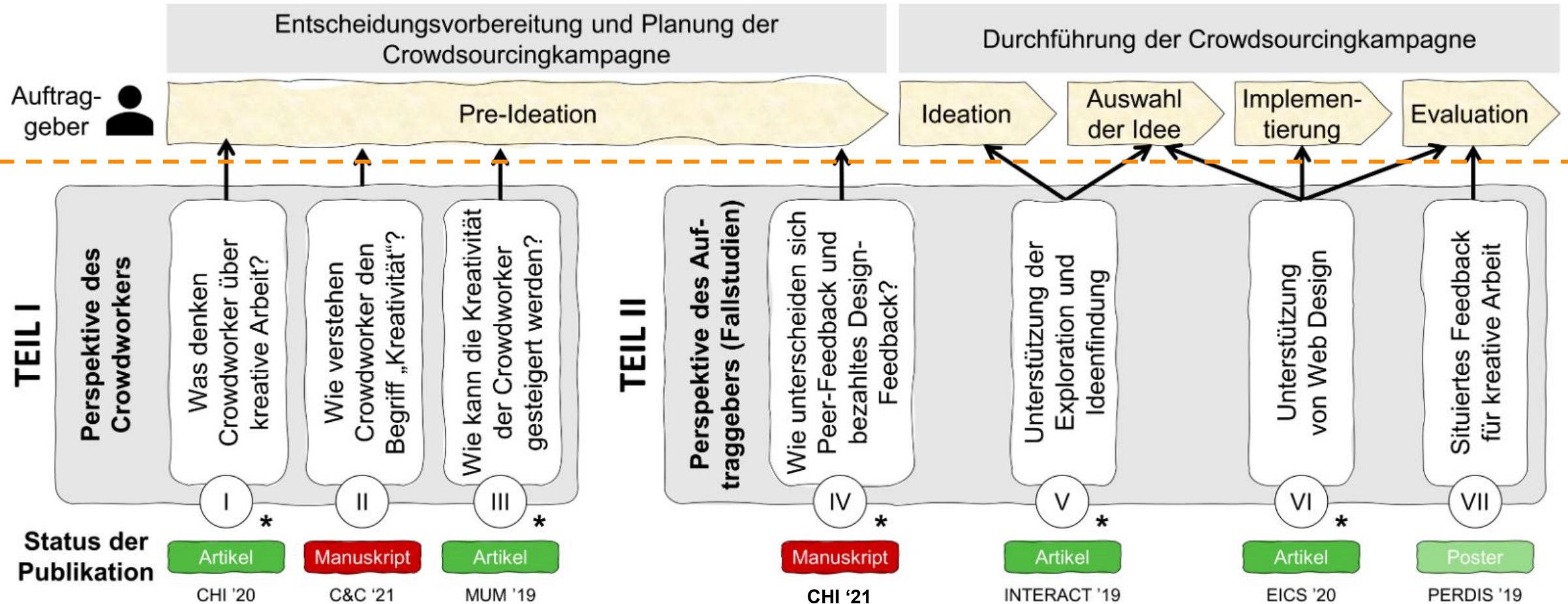
# Approach

# Generischer Kreativer Prozess des Requesters

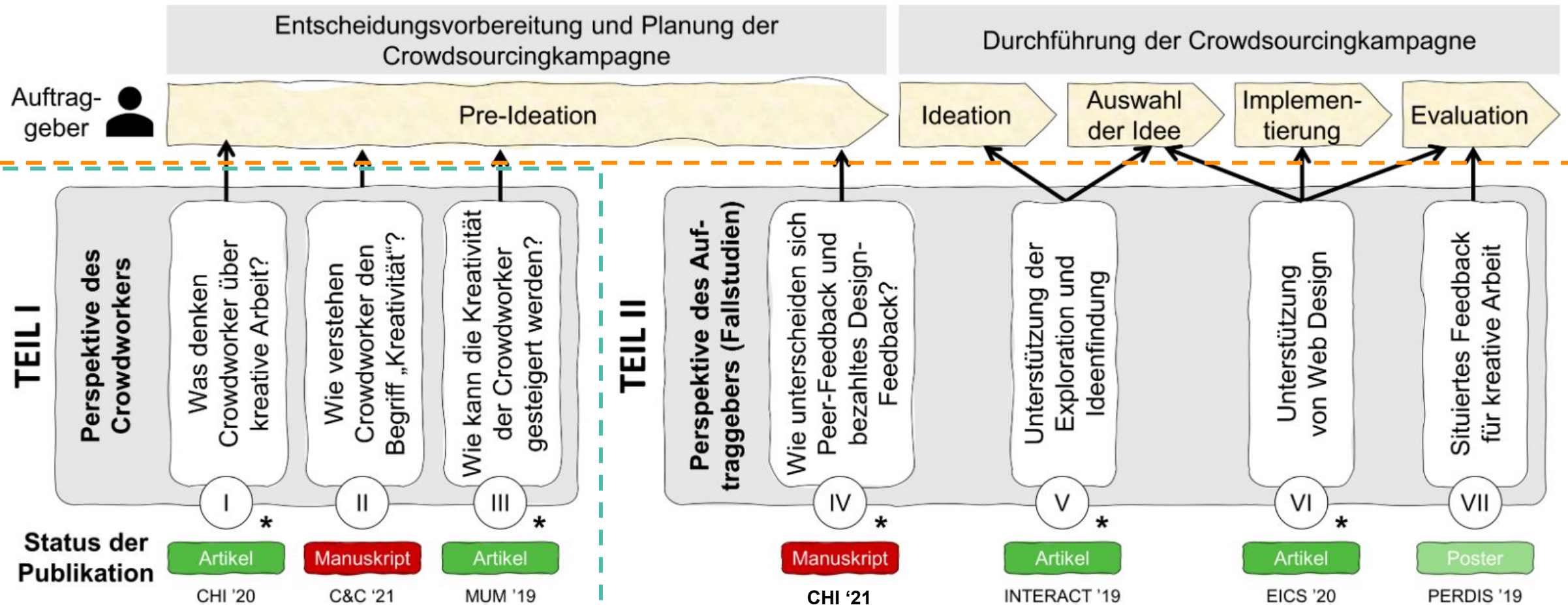




# Kreativer Prozess des Requesters

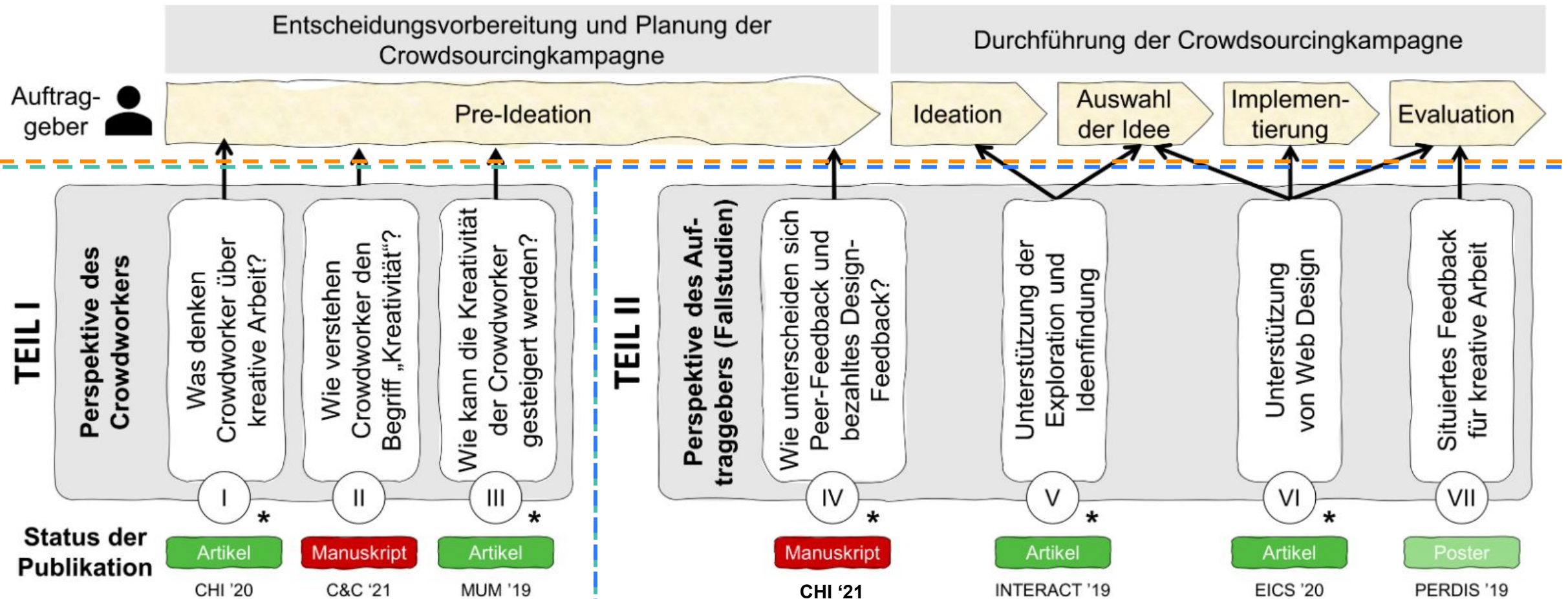


# Kreativer Prozess des Requesters



Crowd Worker

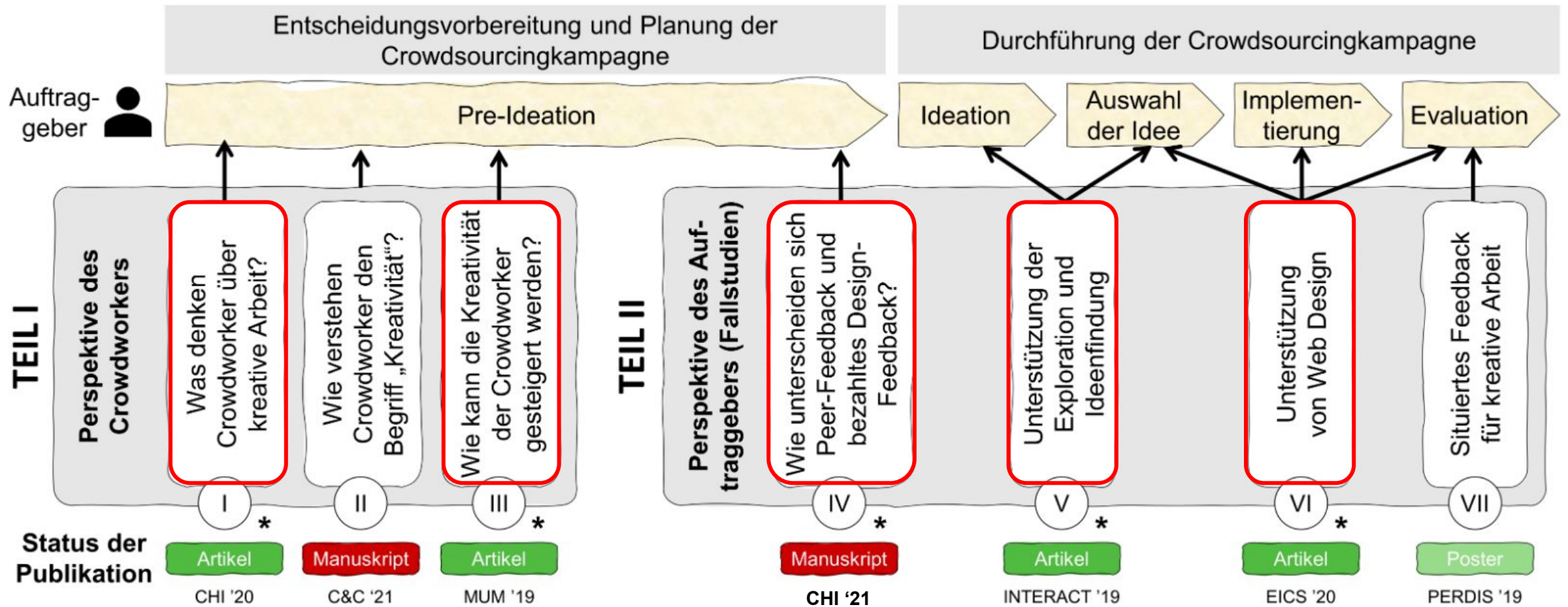
# Kreativer Prozess des Requesters



**Crowd Worker**

**Fallstudien**

\* Teil der Dissertation





# Paper

( Schnelldurchlauf )



# Creativity on Paid Crowdsourcing Platforms

## Forschungsfrage

- Was denken Crowdworker über kreative Arbeit?

## Methode

- Umfrage auf *Amazon Mechanical Turk* und *Prolific* (N=215)

## Ergebnisse

- Unterschiede zwischen den Crowdsourcing Plattformen
- Fünf Arbeiterprofile  
(Professional, Casual, Pragmatic, Novelty Seeker, und Self-Developer)
- Standardisierte Kreativitätstest sind weit verbreitet
- Crowdworker arbeiten gerne alleine

Jonas Oppenlaender, Kristy Milland, Aku Visuri, Panos Ipeirotis, and Simo Hosio. 2020. Creativity on Paid Crowdsourcing Platforms. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–14. DOI:<https://doi.org/10.1145/3313831.3376677>



# Design Recommendations for Computational Priming

## Forschungsfrage

- Wie kann die Kreativität der Crowdworker gesteigert werden?

## Methode

- Computational priming: Rollen

## Ergebnisse

- Kein signifikanter Zusammenhang zwischen Rollen und Kreativität
- Rollen eignen sich bei Ideenblockade
- Designvorschläge für kreative Tasks auf Crowdsourcingplattformen

Imagine you are a Baker



**As a Baker**, think of unique and unusual uses for a **BRICK**.

For example, using a brick as an earring is an unusual and unique use. However, using a brick to build a wall is not unique or unusual.

This task is spread over 3 stages. Stage 1 is below.  
Your answers must, however, be **unique** across all stages.

Please provide at least 4 different answers - one answer per textbox below.  
There is no minimum or maximum word count, simply explain the use case concisely.  
DO NOT (!) use any external sources (e.g., websites, people) to complete this task.



Use 1



# Peer Feedback versus Crowdsourced Feedback

## Forschungsfrage

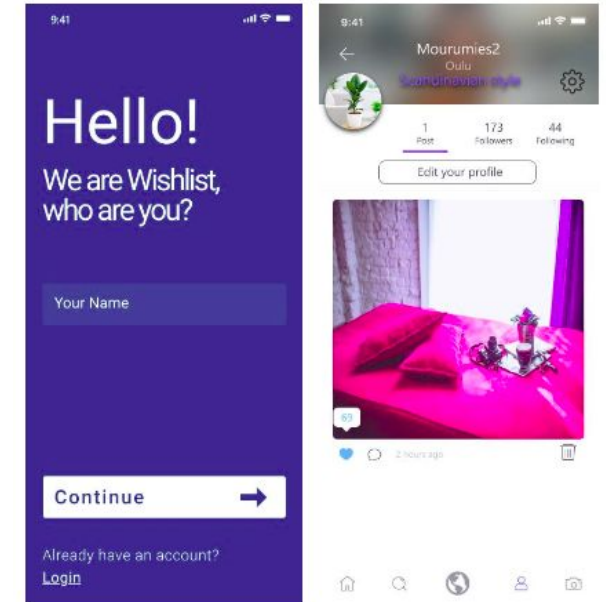
- Wie stellt sich die gefühlte Erfahrung von Crowdsourcing-gestütztem Feedback für den Requester dar?

## Methode

- Within-Subject Experiment mit Studenten eines HCI Design Kurses (N=106)

## Vorläufige Ergebnisse

- Fairness-Kriterien
- Kriterien für die monetäre Wertbestimmung des Crowd-Feedbacks
- Designvorschläge für Feedback im Kontext eines Uni-Kurses





# Search Support for Exploratory Writing

## Fallstudie

- Unterstützung der Exploration und Ideenfindung

## Methode

- Web-basiertes Interface mit Faceted Sorting
- Vergleich mit Google

## Ergebnisse

- System unterstützt multi-keyword Suche nach Informationen

## Discover treatment ideas for low back pain

Set a criteria configuration (left column), hit "query ideas" and we'll fetch you a few best-matching options!

### Instructions:

! You have not specified a value for this criterion.

### Specify Criteria:

Cost (Cost to the patient)

>>>Desired level: (1-100): 1

Speed (Speed of effect)

>>>Desired level: (1-100): 1

Duration (Duration of effect)

>>>Desired level: (1-100): 1

Efficiency (Efficiency in general)

>>>Desired level: (1-100): 100

Query ideas!

Reset criteria

### Results:

#### #1: Exercise in general

Distance to optimal: 39.

Exercise in this case means purposefully shape / increasing fitness, or simply for the

#### #2: Stretching

Distance to optimal: 46.2.

Increasing the mobility of the back with muscles, overall aiming to improve the situation

#### #3: Treating secondary conditions

Distance to optimal: 49.9.

Treating other conditions than low back pain, such as obesity.

#### #4: Information, education

Distance to optimal: 50.2.

Information refers to making the patient understand the reasons, different options to treat it and treat the patient, but to motivate the patient to remedy the situation.

#### #5: Ergonomics

Distance to optimal: 58.

Oppenlaender J., Kuosmanen E., Goncalves J., Hosio S. (2019) Search Support for Exploratory Writing. In: Lamas D., Loizides F., Nacke L., Petrie H., Winckler M., Zaphiris P. (eds) Human-Computer Interaction – INTERACT 2019. INTERACT 2019. Lecture Notes in Computer Science, vol 11748. Springer, Cham



# CrowdUI: Crowdsourced Web Design

## Fallstudie

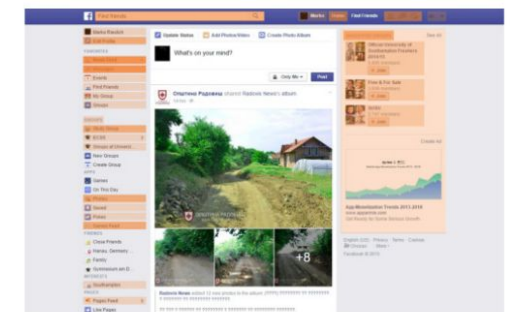
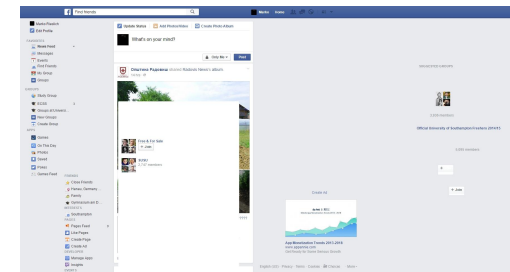
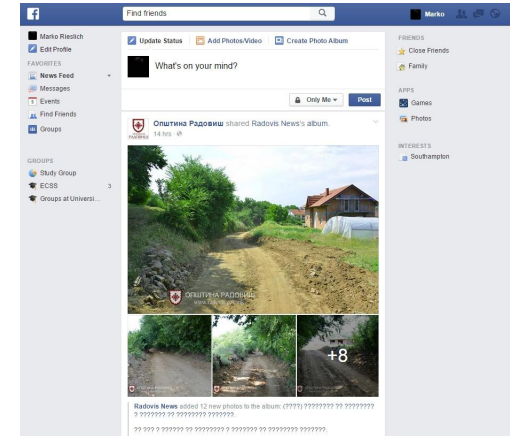
- Visuelles Web design Feedback von der Crowd

## Methode

- System, mit dem User UI Elemente manipulieren können
- Aggregation des Feedbacks in Heatmaps

## Ergebnisse

- Sinnvolle Designvorschläge
- Aggregation unterstützt den Requester in der Auswertung



# Zusammenfassung

- Crowdsourcing & Creativity Support
- Denkanstöße und Designvorschläge für Forscher und Praktiker
- Crowd-powered Creativity Support im Bereich der Mensch-Computer-Interaktion

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