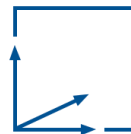


# Enhancing Inclusion and Innovation in Games Engineering

Chrysa Bika

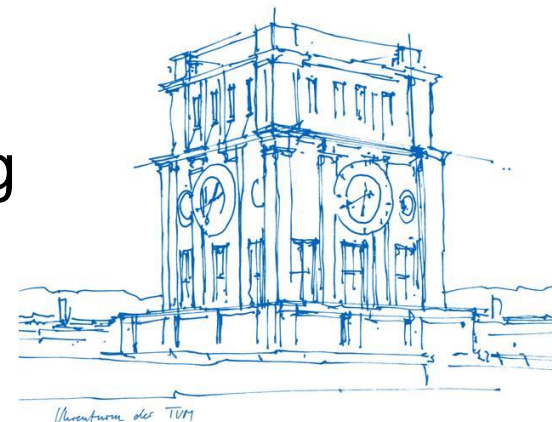
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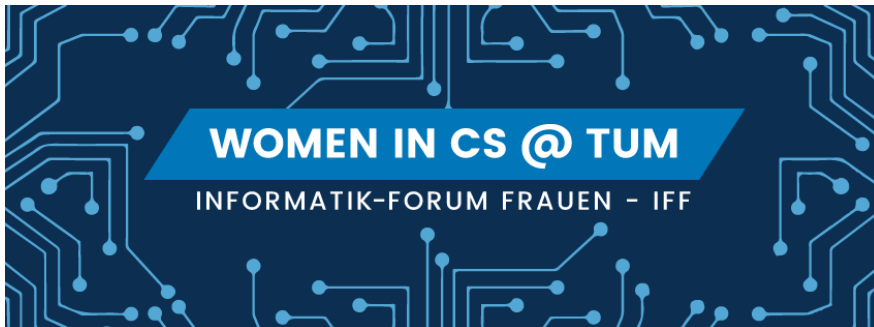
Supervisor: Prof. Gudrun Klinker, Ph.D.

Advisor: Daniel Dyrda, M.Sc.

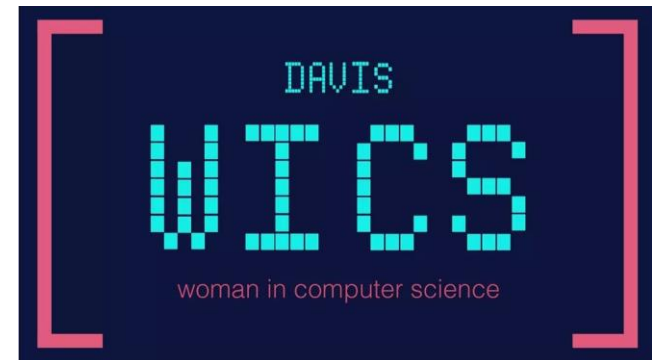


# Motivation

- Personal Background
- Globalization enables a diverse and inclusive workforce



IFF at TUM [Tec20a]



WICS at UCD [Dav]

# Terminology

- **Discrimination:** race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status, association with a national minority
- **Unconscious Bias:** unaware tendency or inclination against a group of people or an individual, ideas or objects [Psy20]
- **Diversity:** bring people with different viewpoints and stories together and highlight their unique experiences
- **Inclusion:** organizational objectives aiming to empower everybody to actively participate
- **Innovation:** renewal or introduction of something new in the technological, scientific or economical field [Rei92]  
has been named one of the most important factors to be successful [Gor18]

# Related Work

- Adrienne Shaw: Representation in video games [Sha14]
- Discrimination in visual computing: Joy Buolamwini [BG18]
- Correlation between disabilities and games [BS12; Gib15]



Joy Buolamwini [Mat19]

# Research Questions

- **RQ1:** How is the games engineering sector perceived? In regards to diversity and inclusion while studying and/or working in games engineering.
- **RQ2:** How can we enhance inclusion and innovation in games engineering to create more diverse and inclusive environments and games?

# Methodology

- Thorough literature review
- Develop solution-oriented approaches and methods
- Theoretical + practical exercises for a games engineering curriculum
- Expert interview with a representative of the games industry
  - Studios across the whole world
  - Several years of experience in the games industry
  - Interview: 95 minutes, 30 page transcript

# Computer Games



living computers. museum + lab in Seattle [Paub]

# Gender Stereotypes in Education and at Work

- Underrepresentation of women in STEM [Che+17]
- Less than 20% females in the fields of computer science, engineering and physics [Che+17]
- Sexual discrimination [Con01]
- Decreased self confidence [Con01]
- Being an engineer requires to be very creative [W A]
- Creativity thrives from life experiences
- Passion for the work [Sch19a]



# Community of Gamers - Gender

- Female game playing community is growing significantly [Hah]
- Male protagonists vs. woman as the sexy sidekick or the damsel in distress [Jen19; BL17a]
- Female gamers are often perceived as spoilsports or intruders [BL17a; Jen19]



# Community of Gamers - Disability

- Do not simply make assumptions about the behaviour of people with disabilities and their reactions to certain game features [LHF17]
- Distinction into three major categories: perceptual, motor, and cognitive/intellectual disabilities [LHF17]
- People without disability use them as well: audio books, speech recognition and captioning [Laz15]

# Methods and Solution-Oriented Approaches

## 1. Raise Visibility and Awareness (internal and external)

- Group and panel discussions, presentations
- Mentors, role models and buddy systems
- Workshops and training seminars
- Conferences and Scholarships
- Goals
  - Eliminate misunderstandings/misconceptions
  - Improve institution's environment
  - More innovative products
  - Wider target group





## 2. Test and Surveys

- Implicit Association Test (IAT)
- Reveals biases, attitudes, stereotypes, self-concept, self-esteem [Hof+05]
- Surveys and questionnaires: social-scientific context to determine views, opinions, and needs of a target group [Rei92]
- Risks of IAT
  - Not ethical to demand of somebody to take the test, nor to have them share their feedback [11b]
  - More instability within the company and less innovation
  - Feeling monitored and stressed
- Advantages of Surveys
  - Analyze the current state of the company [Rei92]
  - Improve the company's environment
  - Interviewee's company became aware of a lot of aspects

### 3. Team and Project Structures

- Assessment of current situation and conditions
- Secure existing processes
- Use of artificial intelligence (AI) for effective meetings
- Always keep an updated version of the Game Design Document (GDD)
- Advantages and Disadvantages
  - AI: confidence in technological improvements [Chr17]
  - AI: security and data privacy issues [Chr17]
  - GDD: improve the communication and memorization [Sch19b]
  - GDD: valuable for the quality assurance
  - GDD: time effort



## 4. Making Games More Inclusive

- Identify with character and develop throughout the story [Hah]
- Stop sexualizing female characters and stop putting them in conservative roles [Jen19]
- Example: “Far Cry 5”, “Far Cry New Dawn” and “Far Cry 6” by Ubisoft: Choose the gender of the protagonist [Ubi20] [Sar20]
- Accessibility options
  - Create and use checklists and guidelines for accessibility [BS12]
  - Example: “The Last of Us Part II” by Naughty Dog
    - More than 60 accessibility options [Pla20]
    - Vision, hearing and motor accessibility
    - Skip puzzle options, provided with awareness indicators, navigation and traversal assistance,...



## 5. Education and Workshops

- Include a module/lecture in a games engineering curriculum
- Sensitize students to diversity, inclusion and accessibility
- Practical and theoretical exercises within a lecture
- Practical accessibility module: develop a game with at least three accessibility features
- #IamRemarkable Workshop
- Evaluation with Interviewee
  - Eliminate misunderstandings
  - Triple A industry focusses on accessibility: Last of Us Part II
  - Workshops have to take place constantly [SB16]
  - Cost of resources, such as money and time



# Suggested Future Work

- Application of methods in real-life
- Conduct a user study
  - Evaluation of the introduced solution-oriented methods
- Execute more expert interviews with:
  - Representatives from academia and the games industry
  - Gender and inclusion equality officers





# Conclusion

- Analyze the state-of-the-art
- Secure and evolve this processes
- Education in schools, university and the work place
- Address inclusion constantly
- Diversity & Inclusion → Creativity → Innovation



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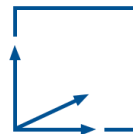
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