Shivam Agarwal

Curriculum Vitae

Turmstrasse 1
Essen - 45127, Germany
(+49) 1523 8829 378
✉ shivam.agarwal@paluno.uni-due.de
🏠 My Webpage
in *https://www.linkedin.com/in/shivamlearning*

Education

2017–present	**PhD, Computer Science**, *University of Duisburg-Essen*, Germany.
2013–2015	**Masters in Information Technology**, *International Institute of Information Technology, Bangalore*, India.
2007–2011	**Bachelors in Computer Science and Engineering**, *United College of Engineering & Research*, India.

Research

My research interests primarily include two domains of computer science: **visualization** and **artificial intelligence (AI)**. More precisely, I am interested in visualizing the dynamic memberships of entities in overlapping groups and their interactions. In the application scenario of game analytics, I focus on building visual approaches that help to investigate the player (humans and AI) strategies in computer games. I am also interested in pedagogy, building research solutions to enhance the learning of students. These projects include building visualizations to show student engagement, collaboration in small teams (project groups), and finding simplistic visual alternatives to complex concepts in artificial intelligence.

PUBLICATIONS

2021   Shahid Latif, **Shivam Agarwal**, Simon Gottschalk, Carina Chrosch, Felix Feit, Johannes Jahn, Tobias Braun, Yannick Christian Tchenko, Elena Demidova, and Fabian Beck. Visually connecting historical figures through event knowledge graphs. In *IEEE VIS - Short Papers (Preprint)*. 2021.

2021   Cedric Krause, **Shivam Agarwal**, Mohammad Ghoniem, and Fabian Beck. Visual comparison of multi-label classification results. In *Vision, Modeling, and Visualization*. 2021.

2020   **Shivam Agarwal**, Günter Wallner, and Fabian Beck. Bombalytics: Visualization of competition and collaboration strategies of players in a bomb laying game. *Computer Graphics Forum*, volume 39, pages 89–100, 2020.

2020   **Shivam Agarwal**, Gleb Tkachev, Michel Wermelinger, and Fabian Beck. Visualizing sets and changes in membership using layered set intersection graphs. In *Vision, Modeling, and Visualization*. The Eurographics Association, 2020.

2020   **Shivam Agarwal**, Shahid Latif, and Fabian Beck. How visualization PhD students cope with paper rejections. In *Proceedings of Celebrating the Scientific Value of Failure (FailFest) Workshop at IEEE VIS*. 2020.

2020   **Shivam Agarwal**, Christian Herrmann, Günter Wallner, and Fabian Beck. Visualizing AI playtesting data of 2d side-scrolling games. In *Proceedings of IEEE Conference on Games*. 2020.

2020   **Shivam Agarwal** and Fabian Beck. Set streams: Visual exploration of dynamic overlapping sets. *Computer Graphics Forum*, volume 39, pages 383–391, 2020.

2020   **Shivam Agarwal**, Jonas Auda, Stefan Schneegaß, and Fabian Beck. A design and application space for visualizing user sessions of virtual and mixed reality environments. In *Vision, Modeling, and Visualization*, 2020.

2018 **Shivam Agarwal**, Jürgen Bernard, and Fabian Beck. Computer-supported interactive assignment of keywords for literature collections. In *Proceedings of the 1st International Workshop on Machine Learning from User Interaction for Visualization and Analytics at IEEE VIS*. 2018.

2018 Kuruvilla Lukose, **Shivam Agarwal**, Vidyashankar Nagesha Rao, and Jaya Sreevalsan-Nair. Design study for creating pathfinder: A visualization tool for generating software test plans using model based testing. In *Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - Volume 2: IVAPP,*, pages 289–300. INSTICC, SciTePress, 2018.

2017 Jaya Sreevalsan-Nair and **Shivam Agarwal**. NodeTrix-CommunityHierarchy: Techniques for finding hierarchical communities for visual analytics of small-world networks. In *Proceedings of the 12th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - Volume 3: IVAPP, (VISIGRAPP 2017)*, pages 140–151. INSTICC, SciTePress, 2017.

Conference Presentations

2020 **Vision, Modeling, and Visualization (VMV)** , *Visualizing Sets and Changes in Membership Using Layered Set Intersection Graphs*.

2020 **Vision, Modeling, and Visualization (VMV)** , *A design and application space for visualizing user sessions of virtual and mixed reality environment*.

2020 **IEEE Conference on Games**, *Visualizing AI playtesting data of 2d side-scrolling game*.

2020 **EuroVis**, *Bombalytics: Visualization of competitionand collaboration strategies of players in a bomb laying game*.

2018 **Machine Learning from User Interaction for Visualization and Analytics (MLUI) workshop at IEEE VIS**, *Computer-supported interactive assignmentof keywords for literature collections*.

Research Community Service

2021 **Student Volunteer** in *ACM CHI Play* 2021, *IEEE VIS* 2021, and *EuroVis* 2021 conferences.

2021 External **reviewer** of full paper in *CHI* 2021.

2020 External **reviewer** of full paper in *CHI PLAY* 2020.

2018 External **reviewer** in *Machine Learning from User Interaction (MLUI)* workshop co-located with *IEEE VIS* 2018 at Berlin.

Honors & Awards

2020 **First Prize in Visualizing Intelligent Train Scheduling**, *NeurIPS 2020*.
Our work on providing visual analytics support for visualizing intelligent train scheduling was awarded first prize in community contributions category in *Flatland* competition held at NeurIPS 2020. (*Details*)

2020 **Best Paper Award**, *VMV 2020*.
Our work titled "Visualizing Sets and Changes in Membership Using Layered Set Intersection Graphs" received the best paper award Vision, Modeling, and Visualization (VMV) 2020 conference. (*Details*)

2019 **Awarded for Visual Analytics in AI Development**, *NeurIPS 2019*.
Our work titled "Bombalytics: Visualization of Competition and Collaboration Strategies of Players in a Bomb Laying Game" on providing visual analytics support for crowdsourced game AI development was awarded in *Pommerman* competition held at NeurIPS 2019. (*Details*)

2016 **Best Paper Award Nominee**, *IVAPP 2017*.
Our work titled- "NodeTrix-CommunityHierarchy: Workflow for Finding Hierarchical Communities for Visual Analytics of Small-world Networks," has been **nominated for Best Paper Award** in Information Visualization Theory and Applications (IVAPP) 2017.

Work Experience

June 2017– present **Research Associate**, *Visualization Research Group*.
University of Duisburg-Essen, Germany

Mentor: Fabian Beck, *Assistant Professor*

July 2015– June 2017 **Research Associate**, *Graphics Visualization Computing Lab (GVCL)*.
International Institute of Information Technology, Bangalore
Worked on visual analytics of multilayer small world networks. Also developed linked interactive visualizations for ocean data by INCOIS.

Mentor: Jaya Sreevalsan-Nair, *Associate Professor*

July 2011– June 2013 **Systems Engineer**.
Infosys Ltd., Chennai, India
Involved in automating application process for customers of Royal Bank of Scotland. Used IBM Websphere product - WAS for deployment as platform.

Teaching

Supervised Thesis

2020 **BA Thesis**, *Interactive Data Comics*.

2020 **MA Thesis**, *Visually Analysing Spatio-Temporal Workshop Production Data through Dynamic Graphs*.

2020 **BA Thesis**, *Visual Comparison of Reinforcement Learning Algorithms based on their Performance*.

2019 **BA Thesis**, *Visualizing Behavior of AI Players in Computer Games*.

Teaching Assistant

(Details: https://www.vis.wiwi.uni-due.de/en/teaching/)

Project course on Visualization for Social Good, *Summer semester 2021*.
Supervised a project course for both BA and MA students. The course format was designed to work together with a seminar course with the same theme of visualization for social good.

Visualization Project course on Game Analytics, *Winter semester 2020/21*.
Organized a project course for both BA and MA students with focus on game analytics. Developed the format of the course from scratch.

Project Group: Comparative Training of Computer Game AI Agents (CompaT AI), *Summer semester 2020*.
Organized and supervised a project group with five MA students. Re-structured the format of project group to focus on teamwork for a better learning experience, taking inspiration from agile software development methodology.

Seminar on Visualization for Machine Learning, *Summer semester 2019*.
Supervised the seminar offered to BA students interested in visualization and machine learning.

ISV: Information and Software Visualization, *Summer semester 2018*.
Designed homework exercises for the course offered to MA students, organized tutorials on visualization technologies, and organized weekly sessions.

Computer Graphics, *Winter semester 2017/18, 2018/19*.
Organized weekly sessions to discuss the weekly homework exercises.

Referees

Dr. Fabian Beck
Assistant Professor,
University of Duisburg-Essen, Germany
https://www.vis.wiwi.uni-due.de/en/team/fabian-beck/
✉ fabian.beck@uni-due.de
✉ fabian.beck@uni-bamberg.de