Industry Meets Research: Future Needs and Opportunities for Visual Analytics in Industrial Manufacturing

Markus Wagner[1*] Christina Stoiber[1†] Alexander Rind[1‡] Tobias Schreck[2§] Marc Streit[3¶]
Krešimir Matković[4‖]

[1]Josef Ressel Centre for Knowledge-Assisted Visual Analytics for Industrial Manufacturing Data, St. Pölten UAS, Austria
[2]Graz University of Technology, Austria
[3]Johannes Kepler University Linz, Austria
[4]VRVis Research Center, Vienna, Austria

1 Description of the Panel Topic

Industrial manufacturing is increasingly shaped by data-driven processes, making Visual Analytics (VA) a key enabler for innovation. This panel explores how VA can address real-world industrial challenges through academic and industry collaboration. We believe that a panel discussion dedicated to this topic will provide valuable insight into the intersection of visual analytics and industrial manufacturing, offering a stimulating exchange between academia and industry. By bringing together experts from both fields – industry and VA research, the panel aims to highlight emerging challenges, future needs, and strategic directions for integrating visualization and analytics in industrial production environments. Central to the discussion is the question: *How can visual analytics effectively support the evolving demands of industrial manufacturing?* The panel aims to explore and outline strategic directions that align scientific advances with real-world operational needs. No prior experience in industrial manufacturing or visual analytics is required to attend. However, participants will benefit from discussions on practical applications, technological innovations, and industry-driven challenges, making this panel relevant for both newcomers and experienced professionals.

2 Panel Format and Anticipated Schedule

We aim for a lively and engaging discussion between the panelists and the audience, bridging the gap between academic research and industrial manufacturing challenges in the context of visual analytics. The 75-minute session will be structured as follows:

- 15 min: Welcome and introduction by moderator
- 45 min: Moderated discussion
- 15 min: Concluding statements by panelists & organizers

Community Interaction Drawing on the need for a balanced exchange between academic and industrial viewpoints, we will conduct a short qualitative survey before the conference to collect topics and prioritize them together with the panelists. This survey will gather insights from academic researchers and industry professionals on current challenges, limitations, and opportunities for visual analytics in manufacturing. The results will be summarized, and selected responses (with permission) will be shared during the panel to enrich the discussion with real-world perspectives.

*e-mail: markus.wagner@fhstp.ac.at
†e-mail: christina.Stoiber@fhstp.ac.at
‡e-mail: alexander.rind@fhstp.ac.at
§e-mail: tobias.schreck@tugraz.at
¶e-mail: marc.streit@jku.at
‖e-mail: matkovic@vrvis.at

Audience Interaction To foster an interactive and dynamic session, we will actively engage the audience using Mentimeter. Attendees can ask live questions, vote on key discussion topics, and contribute their perspectives in real time. This approach ensures that the discussion remains relevant, responsive, and engaging, reflecting the diverse interests of both industrial practitioners and visualization researchers.

Panel Moderation To ensure a well-balanced discussion that bridges both academic and industrial perspectives, the panel will be moderated by **Marc Streit**, an expert in industrial research with experience in both applied manufacturing challenges and visual analytics methodologies. This dual perspective will allow the moderator to navigate the discussion effectively, pose relevant questions, and facilitate meaningful exchanges between panelists and the audience. By understanding the priorities of both research and industry, the moderator will guide the conversation toward practical insights, strategic directions, and opportunities for collaboration.

3 Prospective Panelists

The four-person panel consists of two industry representatives and two researchers from across Europe, all of whom are internationally recognized experts in their respective fields. Industry panelists bring hands-on experience in applying visual analytics to industrial manufacturing, while academic panelists contribute cutting-edge research insights that shape the future of visualization in this domain. Although the panelists are from Austria and Central Europe, their companies are active globally, and their challenges and opportunities apply to a broader scale. This balanced composition ensures a diverse, yet targeted debate, highlighting both the practical needs of the industry and the latest advances from academia to foster closer collaboration between the two sectors.

- **Christian Mittermayr**, c.mittermayr@greiner-assistec.com, Senior Project Manager Data Science, Greiner Packaging GmbH, LinkedIn: https://www.linkedin.com/in/christian-mittermayr-7427181a/
- **Harald Piringer**, hp@visplore.com, Visplore GmbH, LinkedIn: https://www.linkedin.com/in/harald-piringer-ba18054/, formerly VRVis [1, 11]
- **Lena Cibulski**, lena.cibulski@uni-rostock.de, Institute for Visual and Analytic Computing, University of Rostock [2, 3]
- **Jörn Kohlhammer**, joern.kohlhammer@igd.fraunhofer.de, Institut für Graphische Datenverarbeitung IGD, Frauenhofer [10]

4 Organizers

Markus Wagner is a professor at St. Pölten University of Applied Sciences and head of the Josef Ressel Centre for Knowledge-Assisted Visual Analytics for Industrial Manufacturing Data (Industrial-Data-Lab). His research focuses on knowledge-assisted visual analytics, interactive data analysis, and Human-Computer In-

teraction (HCI) [7, 21, 22, 18]. He finished his dissertation in Computer Science at TU Wien in 2017, focussing on KAVA [20].

Christina Stoiber is a researcher at St. Pölten University of Applied Sciences, specializing in Information Visualization, HCI, and Visualization Literacy. She completed her dissertation on visualization literacy and onboarding in 2023 [14]. Her research aims to improve the accessibility and usability of visualization tools across various domains [18, 15, 16, 17].

Alexander Rind is a visualization researcher at St. Pölten University of Applied Sciences, with expertise in health visualization, tasks on time-oriented data, and sonification. His current research focuses on knowledge-assisted visual analytics in industry [7].

Tobias Schreck is a professor and head of the Visual Analytics Group at the Institute of Visual Computing at Graz University of Technology. He earned his PhD in Computer Science in 2006 and previously worked at the University of Konstanz and TU Darmstadt. His research in Visual Analytics includes industrial data analysis, including anomaly detection [19], predictive analysis [6, 4], and knowledge-assisted visualization [5]. He co-authored a survey on the field [12].

Marc Streit is a full professor at Johannes Kepler University Linz, leading the JKU Visual Data Science Lab. His research focuses on visualization, visual analytics, and human-AI interaction. He is also co-founder and CSO of datavisyn, specializing in biomedical data visualization. He is a key researcher at the COMET K1-Centre Pro2Future, which collaborates with the Austrian producing industry. Together with Tobias Schreck, he co-authored a survey on industrial applications of visual anlytics [12].

Krešimir Matković is the coordinator of the research area Informed decision making with machine in the loop at VRVis. His research focuses on interactive visual analysis of complex data. He has successfully collaborated with numerous scientists and experts across various domains, including automotive [13], ergonomics [8], multi-objective optimization [9], among others.

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