# RESEARCH GROUP

# Trustworthy AI



Business Analytics is about leveraging business data value to drive enterprise performance, while adhering to a fact-based management approach. Which, in turn, hints at companies being able to instrument business workflows by drawing on a wealth of domain expertise and business intelligence. Overall, setting the understanding of data as key in gaining market competitive advantage.

The mission of the Business Analytics (BA) group is to foster collaborations around industry business needs where we develop solutions based on our expertise in advanced analytics and excellence for innovation. The group focuses on instrumenting the latest advancements in AI/ML (with connections to Knowledge Representation and Reasoning) and Analytics Applied Research, to deliver concrete, business value-oriented actionable outputs. BA makes extensive use of analytics, including descriptive, diagnostic, predictive and prescriptive paradigms, to derive critical market and business knowledge, assisting the strategic decision-making process.

BA's experts, including highly-skilled researchers and engineers, come from several different backgrounds and have hands-on proven analytics competency as well as international scientific recognition. We have a solid track record of projects in partnership with the industry, across different sectors of activity, and approach each project as a unique challenge. This means tailor-made innovative solutions (including patents and tools externalised via e.g. spinoffs), the highest level of confidentiality and data protection policies, in full compliance with the European GDPR, options of block grant investment and hybrid financing, as well as advantageous licensing, including exclusivity, and IPR policies.

The group has a strong positioning in the areas of business and data analytics, with applications in Manufacturing and Industry 4.0, financial services, and Health Tech sectors. The vision of the BA group aligns to Luxembourg's and EU's strategic directions, observing, among others, the upcoming (r)evolution in Quantum Computing, societal needs and Trustworthy AI (EC's Artificial Intelligence Act, April 21st, 2021).

## Main expertise fields

- Business Analytics
- Trustworthy Artificial Intelligence
- Machine Learning
- Stochastic modelling
- Simulation
- Financial modelling, fund analytics, liquidity risk, collateral & risk management.

## Research challenges

High-end research in analytics and applied AI/ML, while observing a close alignment to Luxembourg's national and EU strategic directions. We tackle challenges such as:

- How to use analytics to extract knowledge and gain insights for a more fact-driven business decision?
- How to benefit from Artificial Intelligence to instrument business workflows?
- How to move towards more explainable and trustworthy Artificial Intelligence?
- How to use analytics of business historical data to minimise risks and improve efficiency?

The main objective is to invent, design and assess AI and Analytics-based Systems for Business Decision Making. Delivering value, transformative innovation and applied state-of-the-art research in a business setup. Such systems need to be understandable (by experts and non-experts), both in terms of internal functioning and relationship between input and output, while limiting, for example, (un)intentional bias, enforcing accountability and traceability. We target, among others, AI Transparency, Fairness and Accountability.

## Application areas:

- Industry 4.0
- Finance
- ICT
- Health Techs
- Automotive

## Main assets:

- Goodyear
- ArcelorMittal
- Ceratizit
- Paul Wurth

## Selected publications:

Sun, H., Kraussl, R., & Rinne, K. (2021). Does Family Matter? Venture Capital Cross-fund Cash Flows. 28th Annual Global Finance Conference, Top Paper Award .
Iffat, U., Bhatia, S., Tantar, A., Sanz, J., Schockaert, C., Schimtz, A., Giroldini, F., Reuter, Y., & Hansen, F. (2018). 20th IEEE International Conference on Business Informatics (CBI 2018), Vienna, Austria, 11-13 July 2018, vol. 2, pp. 89-91
Domingos, C., Da Silveira, M. & Pruski, C. (2020). Construction and exploitation of an historical knowledge graph to deal with the evolution of ontologies. Knowledge-Based Systems. 194. 105508. 10.1016/j.knosys.2020.105508.

# Partners

ArcelorMittal , Paul Wurth , Ceratizit, Goodyear, Luxair, Department of Finance at the University of Luxembourg, Clearstream Banking, Bank of New York, Mellon

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