Mustafa Pamuk: Finding Path Towards AI-based Services in the Finance Industry

Abstract:

The ongoing revolution toward AI-based services in corporate financial services presents immense opportunities for automation, efficiency gains, and improved accuracy in areas such as credit scoring, financial statement analysis, and risk assessment. However, this transformation brings numerous structural, technical, organizational, and regulatory challenges. Financial institutions must navigate the complexities of AI implementation while balancing innovation with stringent regulatory requirements, such as those outlined in the European AI Act and the Digital Operational Resilience Act (DORA). These regulations emphasize transparency, monitoring, resilience, and accountability, requiring organizations to ensure secure, compliant, and fair AI deployments. Key challenges include mitigating algorithmic biases, addressing data imbalances, and developing robust frameworks for AI model monitoring and maintenance. Corporate financial applications of AI must not only outperform traditional methods in cost-effectiveness and predictive accuracy but also comply with evolving regulations that distinguish between the needs of private and corporate customers. Additionally, imbalanced datasets, particularly in applications like corporate credit scoring, can lead to biased outcomes. This necessitates advanced preprocessing techniques and continuous monitoring to ensure fairness, reliability, and accuracy. Given the dynamic and heavily regulated nature of the financial sector, AI adoption requires structured methodologies, strategic documentation, and proactive collaboration among financial institutions, regulators, and technology providers. This dissertation critically examines the 'problem triangle,' encompassing AI research, regulatory demands, and industry-specific requirements. It aims to provide scientific and practical recommendations for addressing the technical, structural, and regulatory barriers to AI adoption. By fostering transparency, resilience, continuous monitoring, and operational efficiency, the research seeks to help financial institutions unlock AI's transformative potential while maintaining regulatory compliance and customer trust.