GOVERNANCE OF AI ALGORITHMS IN THE FINANCIAL SECTOR

Webinaire
“Confidence and regulation of AI-based algorithms”
29 September 2021
THE STAKES - WHY IS THE ACPR INTERESTED IN AI?

<table>
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<th>Understanding innovation trends in the supervised financial sector</th>
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<td>• In 2018 half of the industry’s projects included AI</td>
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<td>• Risks/opportunities of new techniques</td>
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<td>• Industry transformation potential</td>
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<th>Contributing to regulatory developments</th>
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<td>• Ethical, &quot;cross-sectoral&quot; societal issues</td>
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<td>• Link to financial sector regulation</td>
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<th>Anticipating and promoting innovation in the supervisory Authority (suptech)</th>
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<td>• Make our supervision more effective</td>
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<td>• Monitor tomorrow's algorithms</td>
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AI: OVERVIEW OF ACPR’S APPROACH – FROM 2018 TO 2020

- Move on to a hands-on approach
- Mixed teams: data scientists and compliance/supervision experts

3 series of workshops:
- **AML**: can AI improve processes?
- **Risk models**: how and under which conditions can they use AI?
- **Customer protection**: how to be sure that algorithms take properly into account customer’s best interest?

- Technical principles (data, performance, stability, explainability)
- Governance (human/algorithm interaction, explanation levels)
- Audit methods and tools
DESIGN AND DEVELOPMENT PRINCIPLES FOR MACHINE LEARNING ALGORITHMS

- Appropriate data management
- Performance
- Stability
- Explainability

➤ The balance between these principles may depend on the use case
GOVERNANCE AND CONTROL OF ALGORITHMS

Key issues:

• Integration into business processes
  • What is the objective? How does it fit in the existing process?
  • Human/algorithm interaction?
  • What engineering methodology?

• Security and outsourcing

• Initial and continuous validation process

• Audit

➢ Our report provide examples of practical responses by professionals to these points
For a given algorithm and a specific use case, the required level of explanation will depend on:

- the person for whom the explanation is intended,
- the risks associated with the process and/or regulatory constraints

When choosing the algorithm, the designer must verify that the explainability of the algorithm is compatible with the highest level of explanation required.
AUDIT OF ALGORITHMS

• Analytical evaluation
• Empirical evaluation
  • Explanatory methods
  • Benchmark datasets
  • Challenger models

• Challenges for the supervisor
  • Training and talents
CROSSING THE BUSINESS, REGULATORY AND ACADEMIC PERSPECTIVES

Partnership with Telecom Paris

- **Explainable AI in finance** – 9 October 2020
- **Fairness of algorithms in finance** - 11 January 2021
- **Sharing data for AI in finance** - 8 March 2021
- **Regulation of AI in the financial sector: regulatory and academic perspectives in Asia and Europe** – 17 May 2021

Partnership with Paris 1 Sorbonne

- **Big data and AI: risks, challenge and application** – 21 March 2019

Others:

- **NLP in finance** – 11 February 2021
EXPLAINABILITY – GOING THROUGH THE LEARNING CURVE

- Technical principles (data, performance, stability, explainability)
- Governance (human/algorithm interaction, explanation levels)
- Audit methods and tools

June 2020

The challenge
Credit risk predictive models have been designed and trained by banking institutions, the goal is to explain them to different audiences.

June-July 2021

- Shedding light on regulatory challenges
- Showcasing the French expertise in data science
- Promoting knowledge sharing and collaboration initiatives fostered by the ACPR and involving actors of the financial sector

Fintech-innovation Hub 29/09/2021
TECH SPRINT ON EXPLAINABLE AI: MAIN TEACHINGS (1/2)

• Multidisciplinary work is required
  • Data science / engineering / viz
  • SME to build high-level concepts

• Should explainability be built or bought?
  • Purpose-built solution more customisable to a use case and organisation
  • Off-the-shelf platform more scalable, fitter for short-term audits

• Creative methods but no one-size-fits-all
  • Swiss army-knife of popular methods (SHAP, LIME, etc.)
  • Consensus on using surrogate models for blackbox inspection
  • State-of-the-art R&D by French actors (Active Coalitions of Variables, Shapash, Skope-rules)

“The pure blackbox auditing approach has shown its limits, and ML modelling projects need to be iterative, agile, multidisciplinary and well-documented.” - Tech Sprint participant

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TECH SPRINT ON EXPLAINABLE AI : MAIN TEACHINGS (2/2)

• Simplicity ≠ transparency
  • Blackboxes make relatively simple models as opaque as deep neural networks
  • Complexity of input data is a key factor in the explainability challenge

• What makes a good explanation
  • Criteria dictated by the use case: conciseness, actionability, business constraints (e.g. monotonicity)
  • Generalisation difficult to define: middle ground between local and global explanations, global explanation of unseen data, etc.

The biggest challenges of blackbox explainability

- Explain the predictive model
- Explain the training algorithm
- Explain the training data
THE FUTURE EUROPEAN REGULATORY FRAMEWORK

- Proposal for a European Regulation
  - Regulation inspired by "product" regulations
  - For "high risk" AI systems (including credit scoring)
  - Cross-sectoral approach (European Committee on Artificial Intelligence)
  - Financial sector authorities will have a role to play ("market supervisory authority" for "high risk" algorithms developed by financial sector institutions)

- European Supervisory Authorities should publish guidance on AI in the financial sector by 2024 (digital finance strategy)
The ACPR must prepare for and prepare the market to:
- The use of AI in the financial sector,
- Its management (regulation and best practices)
- Its supervision
- Its direct use for its own tasks.

➢ Keep on going through the learning curve
➢ Contribute to maintaining involvement of the French market
Thank you for your attention!

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