Insuring AI: How Insurance Can Support AI Development

CAS - Seminar on Reinsurance

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1. Introduction

2. Artificial Intelligence and Risks

3. Insurance of AI

4. Outlook

Introduction

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Jascha Prosiegel

- Underwriting lead for AI risks in North America
- Member of the German Association of Actuaries DAV
- Based in San Francisco, CA

The AI Risks team

- Underwrites AI model performance since 2018
- Insures corporates and tech startups across industries globally
- www.munichre.com/insure-ai

Artificial Intelligence

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Statistical model trained on data

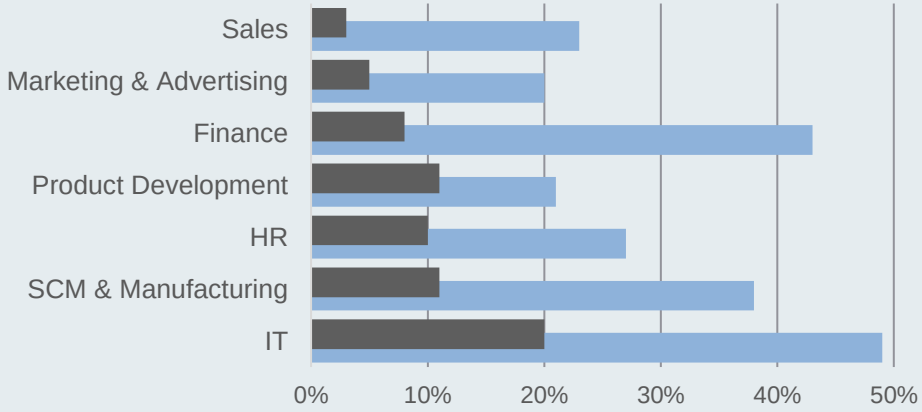
to perform a specific task

cheaper, faster and better

$200bn

Global Annual Corporate Investment into AI[1]

AI being a critical part – 2022 vs 2025[2]



[1)] Stanford HAI, 2023 State of AI Report, [2)] MIT Technology Review, CIO survey on AI adoption

AI Risks

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“the laws of statistics ensure that – even if AI does the right thing nearly all the time – there will be instances where it fails”

John Villasenor, Brookings Institute

Liabilities

Discrimination

Underperformance

Unknown loss scenarios “silent AI” & unknown, increasing downside

AI Performance Risk - Covariate Shift and Concept Drift

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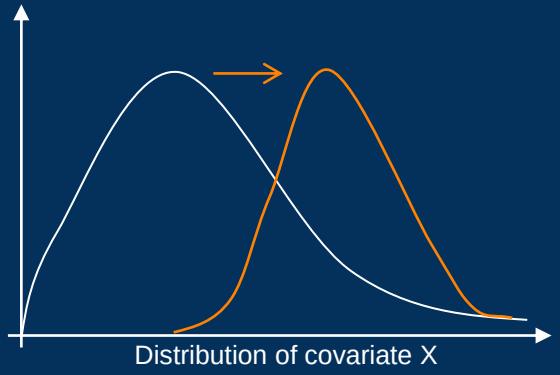
Assumption: $(X_i, Y_i) \sim \tilde{P}_{XY} = \tilde{P}_X \times \tilde{P}_{Y|X}$

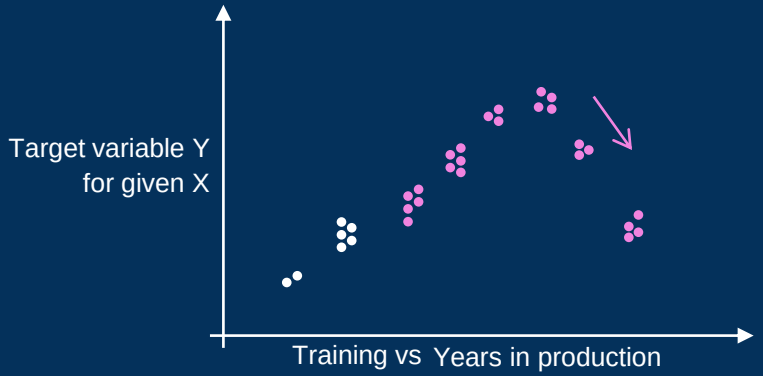
Covariate Shift $P_X \rightarrow \tilde{P}_X$

Change in the distribution of input data between training and production



Concept Drift $P_{Y|X} \rightarrow \tilde{P}_{Y|X}$

Statistical properties of the target variable change over time in unforeseen ways



Insurance Products

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Insure-backed Performance Guarantees

An AI provider adds a targeted performance guarantee to their product. The provider is insured against penalty payouts.

Goal Trust & Sales

Own-Damage Performance Insurance

A corporate automates tasks and services via AI and is insured against specific underperformance scenarios.

Goal Protected Automation

Attractiveness for Insurers

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AI Model Insurance

A portfolio of predictions with a statistical error rate with accumulation and diversification potential.

Insuring the risk of errors above expectation.

Reinsurance

A portfolio of policies with loss frequencies/severity with accumulation and diversification potential.

Insuring the risk of loss ratio above expectation.

Risk Assessment: Areas and Data Analysis

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1. Process Assessment

2. Performance Data Review

Variation over subsets	Variation over time
Stress test results	Business outlook

Outlook

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AI becomes the new normal and takes over more critical tasks

New regulations bring environmental certainty and new requirements.

Even the best AI will make errors. Losses will drive insurance demand.

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Case Studies and more material: www.munichre.com/insure-ai