



A Munich Re company

Being a Statistician or Data Scientist in the Insurance Industry and at HSB and Munich Re

3/23/2022

Nathan Lally: AVP Data Science

HSB: A Munich Re Company

About Me

Where I might rather be this time of year.



Education:

- BA Political Science
- BA Mathematics/Statistics
- MS Mathematics

Career:

- General Dynamics
- The Hartford Insurance
- Pratt & Whitney (Raytheon)
- HSB - Munich Re

Volunteering:

- VP for Education @ NESS

Where I Work & What I Do

HSB and Munich Re Group



Munich Re

Well, that isn't the office building...

HSB



HSB- Hartford Steam Boiler:

- Founded on June 30, 1866, as one of the first companies dedicated to industrial safety.
- HSB offers insurance for equipment breakdown, cyber risk, data breach, identity recovery & employment practices liability.
- HSB's Applied Technology Solutions division leverages IoT to deliver unique risk management solutions

Munich Re Group:

- World's largest reinsurance firm. Operates globally.

What I Do: My Role & My Team

Assistant Vice President: Data Science

- Team Composition:
 - 4 Full Time Data Scientists
 - 2 Interns
 - 3 University Researchers
- Team Educational Background
 - Statistics
 - Computer Science
 - Data Science
- Team Educational Achievement
 - PhD
 - MS
 - BS

Our Organization



What do Statisticians and Data Scientists do in the Insurance Industry?

What do Statisticians and Data Scientists do in the Insurance Industry?

Major Business Areas Supported (Typical Company):

- **Underwriting:** evaluate and analyze the risks involved in insuring people and assets.
- **Actuarial:** analyze the financial costs of risks.
- **Catastrophe Modeling:** model large, simultaneous and often connected loss events (ex. natural catastrophe).
- **Claims:** determine how much the company should pay for a loss.
- **Finance & Risk Management:** optimally manage capital and ensure sufficient holdings to cover rare, adverse events.
- **Digital Marketing:** online marketing optimization.

Unique to HSB – Munich Re:

- **Engineering Services:** perform inspections, research insurable assets, loss control, inform other business units.
- **Internet of Things (IoT):** objects embedded with sensors communicating with each other over networks.

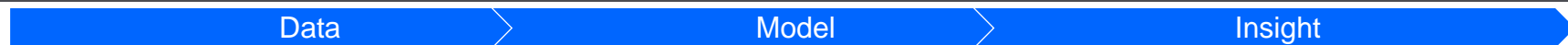
A Consulting Model:

- Statisticians and data scientists generally do not develop or manage insurance products.
- We serve as consultants to business leads; enabling objective decision making based on sound empiricism.

A Shift in Responsibility?:

- In today's business environment, insurance data scientists are now being asked to develop, monetizable data assets and IP.

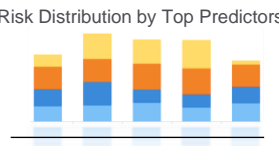
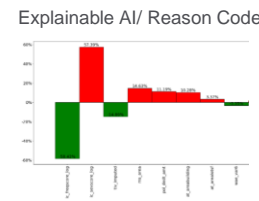
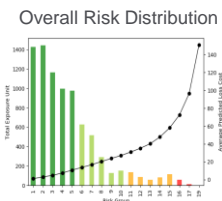
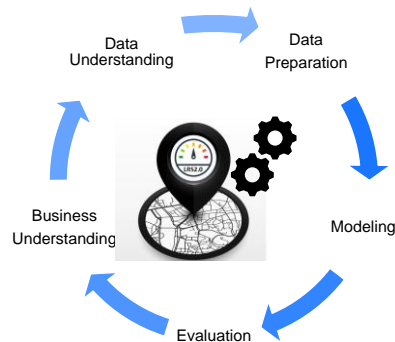
What do Statisticians and Data Scientists do in the Insurance Industry? An Underwriting Example



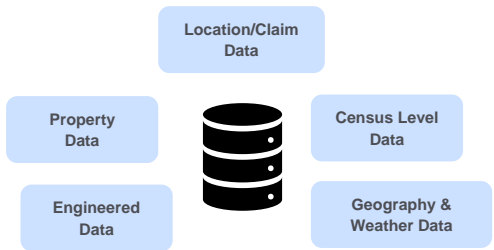
Clients need to improve their property UW, Loss Control and other Risk Management activities.

HSB and Munich Re have valuable proprietary data that can be utilized to provide insight and enhanced risk segmentation for our client companies

This data is enriched with an ever growing set of third-party data sources to create risk models that are built using cutting edge distributed machine learning algorithms with state-of-the-art big data technologies.



Access for Clients are provided via Production Level Data Services



- ✓ **Provides** location specific scores based on the likelihood that the location will have an equipment breakdown loss
- ✓ **Can be used** in focused inspections, a factor used to enhance property loss cost models and sensor placement prioritization

What do Statisticians and Data Scientists do in the Insurance Industry? An IoT Example

Problem:

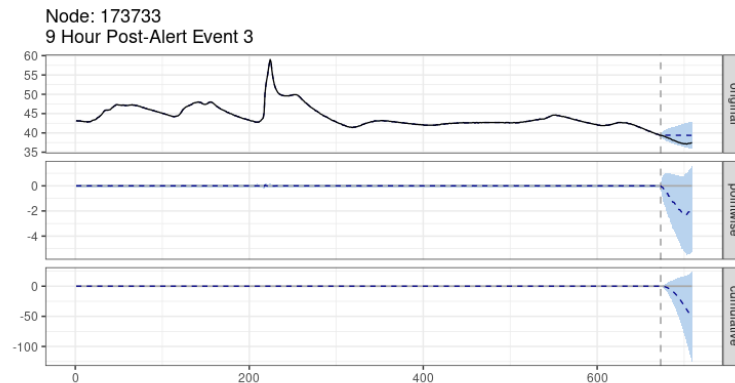
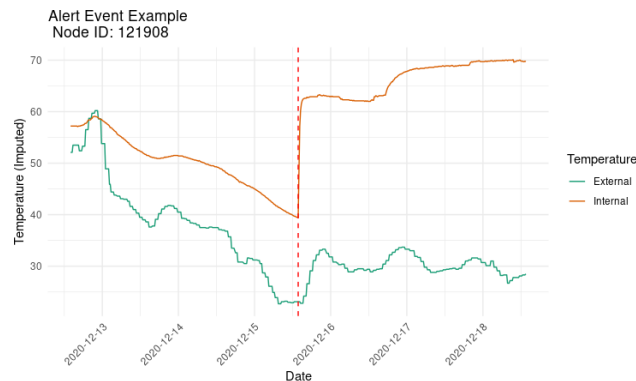
- For HSB’s freeze loss monitoring program to add value to our clients, we need to prove we can motivate behavioral change among end insureds.
- However, customers sometimes fail to acknowledge alerts (respond to calls or texts) at all.

Solution:

- Using sensor data and causal AI/ML methods, infer whether a customer took action from the data alone.

Usage:

- Portfolio performance monitoring
- Outreach/intervention optimization
- Potential for derivative data products



How to Prepare for Insurance Data Science and Statistics Careers

What Skills do You Need to Succeed at HSB?

Core Competencies

Statistics & Machine Learning

- Mathematical Statistics
- GLM & GAM
- Time Series Analysis
- Statistical Learning
- Deep Learning
- Causal Inference

Business Knowledge

- Product Design
- Principles of Underwriting
- Pricing
- Regulation
- Financial Management

Growing Demand

Data Engineering

- Relational DBs
- SQL
- Unstructured Data
- Big Data Technology (ex. Spark, Hive)
- Domain Knowledge

DevOps/MLOps

- Model monitoring, management and deployment
- Code Versioning
- CI/CD Pipelines/Automation
- Containerization

**Insurance
Data
Science**

Career Paths at HSB and Munich Re

Career Paths at HSB and Munich Re

- **Associate Data Scientist**
 - Entry Level
 - Undergraduate
- **Data Scientist**
 - Entry Level – 2+ Years of Experience
 - MS in Quantitative Field
- **Senior Data Scientist**
 - 4+ Years of Experience
 - MS in Quantitative Field or PhD
- **Principal Data Scientist**
 - 6+ Years of Experience
 - MS in Quantitative Field or PhD
- **Data Science Lead**
 - 8+ Years of Experience
 - MS in Quantitative Field or PhD
 - Leads a small focused data science team

Preferred Degree Programs:

- Statistics
- Computer Science
- Mathematics & Applied Mathematics
- Data Science (Non-Business Programs)

Expectations:

- Associate – Data Scientist
 - Work on focused, well defined technical problems
- Senior – Principal Data Scientist
 - Guide technical direction of larger projects, mentor junior staff, collaborate closely with business partners
- Lead Data Scientist
 - Individual contributor and personnel manager

We Are Hiring!

Open Positions



[Senior Data Scientist](#)

We will have 2-3 new positions open soon.

Contact me at Nathan_Lally@hsb.com for questions!