

# Rohan Yashraj Gupta, PhD, ASA, AIA

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## SUMMARY

- PhD in Actuarial Science with close to 6 years of work/project experience in the area of Actuarial Data Science
- Expertise in predictive modelling, data interpreting, and visualization with 8 international journal papers and 1 book chapter
- Speaker in top Actuarial Data Science conferences such as 22nd Global Conference of Actuaries, 2021 Insurance Data Science, 2022 CAS Spring Meeting, 2022 CANW Spring Meet, 2022 ASTIN Actuarial Colloquia
- Invited as a speaker for 2023 CAS International Webinar Series and also by the African Actuarial community
- Developed over 5 web apps/dashboards for dynamic reporting and visualizations to aid in decision-making

## SKILLS

Python and R



Predictive modelling



Machine Learning and Deep Learning



Data visualization and interpretation



Excel



Statistical analysis



## WORK EXPERIENCE

### Actuarial Data Science Consultant

December 2022 – Present

*RSA Actuarial Services, India*

#### • Motor Insurance Fraud

- Developed and implemented a Machine Learning model to prioritize fraudulent cases, resulting in a 20% increase in the success rate of fraud applications.
- Conducted a thorough Full-Time Equivalent (FTE) analysis to estimate the necessary resources to secure previously neglected benefits.
- Created effective business rules based on SIRA reports that reduced the number of potentially fraudulent applications by 70%.

### Actuarial Analyst

Jun 2021 – Nov 2022

*SwissRe Bangalore, India*

#### • Pricing

- Successfully supported 30+ quotes on pricing and experience studies for various products comprising – whole/term life assurance, critical illness benefit, disability benefits and hospitalization benefits for the South-East Asia market
- Conducted impact testing on terms of trade assumptions for whole/life assurance products
- Responsible for monitoring critical illness capacity for over 70+ quotes in the South-East Asia market

#### • Experience studies

- Conducted experience studies using R to derive A/E ratios, resulting in cost revisions that accurately reflected actual experience

#### • R Modeling and dashboarding

- Created and utilized R and Excel models for experience studies, premium trends calculation, and data visualization for life and health products for South-East Asia market
- Utilized R model to generate profit commission for various quotes

#### • Product design

- Collaborated with claims and underwriting teams for product discussions and design, resulting in the successful launch of three new products viz. critical illness products with very specialized product offering

#### • Communication and Presentation

- Presented results to team lead and wrote executive summary detailing pricing strategy to deliver to clients
- Delivered a presentation on "Intro to Machine Learning using Decision Tree"

### Actuarial Consultant

Jun 2019 – Jun 2021

*Tech Actuarial*

As an actuarial data science consultant, some key projects that I worked on were:

#### • Ayushman Bharat Claims Analytics (Oct 2020 – Jun 2021)

- Worked on claims analytics for the world's largest group health insurance scheme using Python and R to provide claims analytics to the broker and insurance company on 200,000+ records

- Developed an RShiny dashboard to track the claims experience monthly, resulting in a 20% improvement in claims management efficiency
- Analyzed claim patterns and fraud in 200,000+ claims and policy records during the COVID-19 period, resulting in a 5% reduction in fraudulent claims
- **Crop Insurance Pricing (Apr 2020 – Sep 2020)**
  - Utilized Python for web scraping of 3 million data points of daily yield data for various crops, resulting in almost 90% reduction in data processing time
  - Developed an ARIMA model to project crop yield data for the next three months resulting in improvement in accuracy of crop yield projections
  - Built a dashboard to track the value of futures under 12 different scenarios for six different crops, resulting in a 70% reduction in time spent on manual data tracking and analysis
- **Cancer Product Pricing (Sep 2019 – Mar 2019)**
  - Successfully priced cancer products for four different packages across 28 states in India
  - Created a dashboard for dynamic comparison and visualization of frequency, severity, and risk premiums by gender and state, totaling to 100+ scenarios, resulting in a improvement in visualization and comparison of pricing scenarios
- **Defined benefit pension scheme valuation (Jun 2019 – Aug 2019)**
  - Simplified valuation using Excel spreadsheet, resulting in a 10x reduction in run time and an improvement in efficiency in the defined benefit pension scheme valuation process
- **Prepared 30+ consulting pitch presentations for various clients over two years**

### **Student Central Summer Internship Program**

**Jun 2020 – Aug 2020**

*Casualty Actuarial Society, USA*

- Completed a six-week program focused on Property & Casualty, gaining insights into data visualization, pricing, reserving, and predictive modeling
- Completed four projects using Cognalysis Multirate software, resulting in improved pricing and reserving strategies.
- Recognized as a "CAS Spotlight Candidate" by the CAS for being an active student member and demonstrating exceptional knowledge and skills in actuarial science

### **Framework for Fraud Detection in Motor Insurance**

**Jun 2017 – May 2021**

*Sri Sathya Sai Institute of Higher Learning*

- Proposed a framework for fraud detection, which includes actuarial and data science techniques
- Generated 450+ business rules used for fraud detection and developed an innovative method to automate rule-generation using machine learning and data visualization
- Used Python and R to develop data-driven fraud detection models for automobile and health insurance businesses with more than 100,000 records and have achieved results with 95%+ accuracy

## **PROFESSIONAL HONOURS & ACHIEVEMENTS**

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- Speaker at 22<sup>nd</sup> Global Conference of Actuaries – Delhi, India, March 2023
- Speaker at 3rd Insurance Data Science Conference – City, University of London June 17, 2021
- Speaker at 2022 CAS Spring Meeting, Disney's Coronado Springs Resort, May 15 - May 18, 2022
- Speaker at 2022 Actuarial Colloquia, organized by Casualty Actuarial Society, with IAA and ASTIN

## **EDUCATION AND RESEARCH**

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### **Doctor of Philosophy (PhD) in Actuarial Science**

**Jun 2019 – May 2021**

*Sri Sathya Sai Institute of Higher Learning*

- Research in the area of data-driven fraud detection and prevention in health and motor insurance business
- Published over eight research papers, one book chapter and presented in five international conference

### **Masters in Mathematics (MSc)**

**Jun 2017 – Apr 2019**

*Sri Sathya Sai Institute of Higher Learning*

- Cumulative CGPA: 8.4/10
- Relevant coursework: Actuarial Risk Management, Loss Reserving, and Financial Engineering, Actuarial Models

### **Honors Bachelor of Science (Mathematics)**

**Jun 2014 – Apr 2017**

*Sri Sathya Sai Institute of Higher Learning*

- Cumulative CGPA: 7.6/10
- Relevant coursework: Linear Algebra, Probability, Numerical Methods and Data Structures in C

## **TRAINING AND LEADERSHIP**

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- Provided training to post-graduate students on actuarial courses and guided actuarial data science projects
- Conducted a 40-hour workshop titled – “Hands-on predictive analytics using python” on various Machine Learning and Deep Learning models
- Volunteered the annual service project called “Grama-Seva” for five consecutive years, where food and clothes were distributed at the doorstep of families across 150 villages in Andhra Pradesh, India

## **RESEARCH PUBLICATIONS**

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### **Journal Papers**

- “Implementation of Correlation and Regression Models for Health Insurance Fraud in Covid-19 Environment using Actuarial and Data Science Techniques,” Int. J. Recent Technol. Eng. Sep. 2020
- “A Comparative Study of Using Various Machine Learning and Deep Learning-Based Fraud Detection Models For Universal Health Coverage Schemes,” Int. J. Eng. Trends Technol., 2021
- “TGANs with Machine Learning Models in Automobile Insurance Fraud Detection and Comparative Study with Other Data Imbalance Techniques,” Int. J. Recent Technol. Eng., Jan. 2021
- “Integrating actuarial models with neural networks for building a fraud detection model for automobile insurance,” J. Emerg. Technol. Innov. Res., 2019
- “A Framework for Comprehensive Fraud Management using Actuarial Techniques,” Int. J. Sci. Eng. Res. , 2019
- “A proposed method with a use case to facilitate the decision of implementing new technology in insurance organizations to improve operational efficiency Variable name,” J. Emerg. Technol. Innov. Res., 2019
- “A Proposed Model for Measuring Protection of Policyholders’ Interest at Industry Level,” IRDAI Journal, 2019
- “Implementation of a Predictive Model for Fraud Detection in Motor Insurance using Gradient Boosting Method and Validation with Actuarial Models”, INCCES, 2019

### **Book Chapter**

- “Application of Cart-Based Modeling in Motor Insurance Fraud,” in Intelligent System Algorithms and Applications in Science and Technology, CRC Press, Taylor and Francis Publications, 2021