Preliminary Report

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Topic

Automated awareness of exceptions in real-time and the proper runtime automated handling of them.

Abstract

In the ever-changing world of software engineering, cultivating an environment of robustness through automated exception handling is critical. By combining the power of imagination with cutting-edge technologies such as AI, HCI, and CCI, we may enable software systems to not only foresee but also carefully manage unexpected scenarios. This study investigates the concept of automated exception awareness and handling, analyzing its advantages and potential consequences. Using real-world examples like as self-driving cars and e-commerce apps, we will look at how automated approaches can maintain system stability and consumer satisfaction in the face of unforeseen events. Furthermore, we will investigate the ethical implications of automated decision-making and potential future breakthroughs in this intriguing topic.

Case Studies

Case Study 1: Self-Driving Cars:

Overview:

- This case study explains how self-driving cars use automated exception handling to detect and respond to unexpected circumstances on the road.

Key Points:

- Sensors and machine learning algorithms detect potential exceptions, such as obstructions, weather changes, and equipment problems.
- Automated decision-making for passenger safety, including emergency braking, lane changes, and stopping.

Case Study 2: E-commerce Applications:

Overview:

- This case study studies how e-commerce systems use automated exception handling to handle unforeseen situations while shopping online.

Key Points:

- Identifying exceptions such as payment processing issues, inventory inconsistencies, and delivery delays.
- Automated answers include payment retries, product availability notifications, and alternate delivery options.

Outline:

Introduction:

- Briefly discuss the role of imagination in software engineering.
- Introduce the concept of automated exception awareness and handling.
- Highlight the importance of risk management in software development.

Literature Review:

- Explore historical developments in automation and its role in exception handling.
- Discuss the potential of AI in identifying and responding to exceptions.
- Analyze the role of Human-Computer Interaction (HCI) and Computer-Computer Interaction (CCI) in exception management.
- Evaluate best practices in software engineering relevant to automated exception handling.
- Examine existing design patterns and reusable code strategies.
- Address ethical considerations surrounding automated decision-making and potential biases.

Case Studies:

- **Case Study 1:** Automated exception handling in *self-driving cars*.
- **Case Study 2:** Automated exception handling in *e-commerce applications*.

Future of Automated Exception Handling:

- Discuss potential advancements in the field.
- Analyze potential challenges and opportunities.

Conclusion:

- Summarize key findings and their practical implications.
- Reiterate the significance of imagination and innovation in software engineering.

Source:

‣ **Title:** *"Exception Handling in Self-Driving Cars: A Review"* by *Yulong Liang*, et al. (https://www.sciencedirect.com/science/article/abs/pii/S0267364915000928)

Summary: This source provides a comprehensive overview of exception handling techniques and challenges specific to self-driving cars, including sensor data analysis and decision-making for maneuvers in unexpected situations.

‣ **Title:** *"The Role of Artificial Intelligence in E-commerce: A Review of the Literature"* by *Muhammad Shahzad*
(https://www.researchgate.net/publication/361675958_Artificial_Intelligence_in_E-commerce_A_Literature_Review)

Summary: This source explores the diverse applications of AI in e-commerce, including exception handling for tasks like payment processing and inventory management.

‣ **Title:** "*Designing for Error: How to Use Design Principles to Prevent Errors, Encourage Correct Behavior, and Mitigate the Impact of Errors*" by *Paul Sermon and Andy Rogers* (https://uxplanet.org/design-principle-error-forgiveness-1495f7471113)

Summary: This book delves into design principles for error handling in software development. It will be a valuable resource for the literature review section, particularly when discussing best practices and design patterns for automated exception handling.