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**Advanced Cybersecurity**

# Cyber Reasoning System

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# Context

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- Widespread use of executables

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- Widespread use of executables
- Increase of vulnerabilities

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- Widespread use of executables
- Increase of vulnerabilities
- Approaches

# Context



- Widespread use of executables
- Increase of vulnerabilities
- Approaches
  - Manual

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- Widespread use of executables
- Increase of vulnerabilities
- Approaches
  - Manual
  - Automated

# Cyber Reasoning Systems

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- Automated vulnerability detection, exploitation and patching

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- Automated vulnerability detection, exploitation and patching
- Developed solutions

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  - DARPA's Cyber Grand Challenge

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    - Mayhem
  - HaCRS

# Motivation

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# Objectives

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- Creation of a functional and open-source prototype

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- Initial limitation for x86 ELF executables

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# Bird's Eye View Architecture

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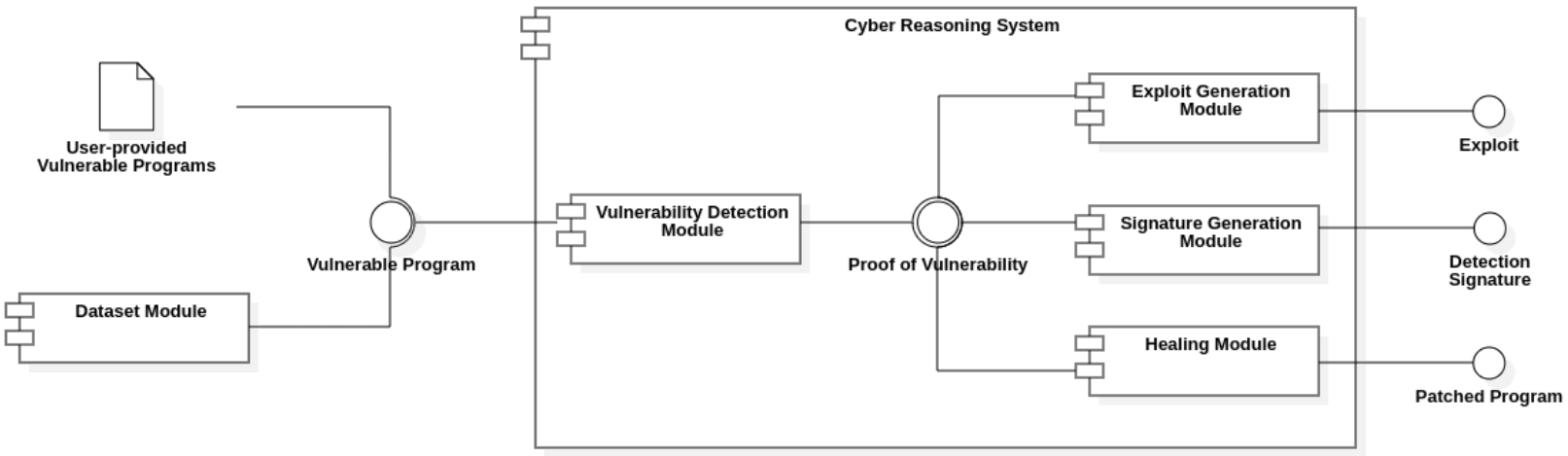

# Current Status

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  - Dataset

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- Researching the field of CRS
- Proposal of an architecture
- Started implementation in Python 3
  - Dataset
  - Attack surface approximation

# Further Development

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- SotA for the proposed technologies

# Further Development



- SotA for the proposed technologies
- Completion of the vulnerability detection module

# Conclusions

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- Automated approach for binary analysis

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- Novelty of CRS

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- Automated approach for binary analysis
- Novelty of CRS *(but with the presented downsides)*

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- Automated approach for binary analysis
- Novelty of CRS *(but with the presented downsides)*
- Proposed CRS study and prototype