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AMRITA VISHWA VIDYAPEETHAM

AUTOMATED VULNERABILITY DETECTION

PRESENTED BY

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Objectives

- Identify the challenges of automated vulnerability detection in code.
- Review the state-of-the-art techniques for automated vulnerability detection in code.
- Propose a new approach to automated vulnerability detection in code using deep representation learning.
  tools : DeepCover,VulnPredict,Fortify SCA,Valgrind.
- Evaluate the proposed approach on a dataset of known vulnerabilities.

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Problem Identification

problem # 1

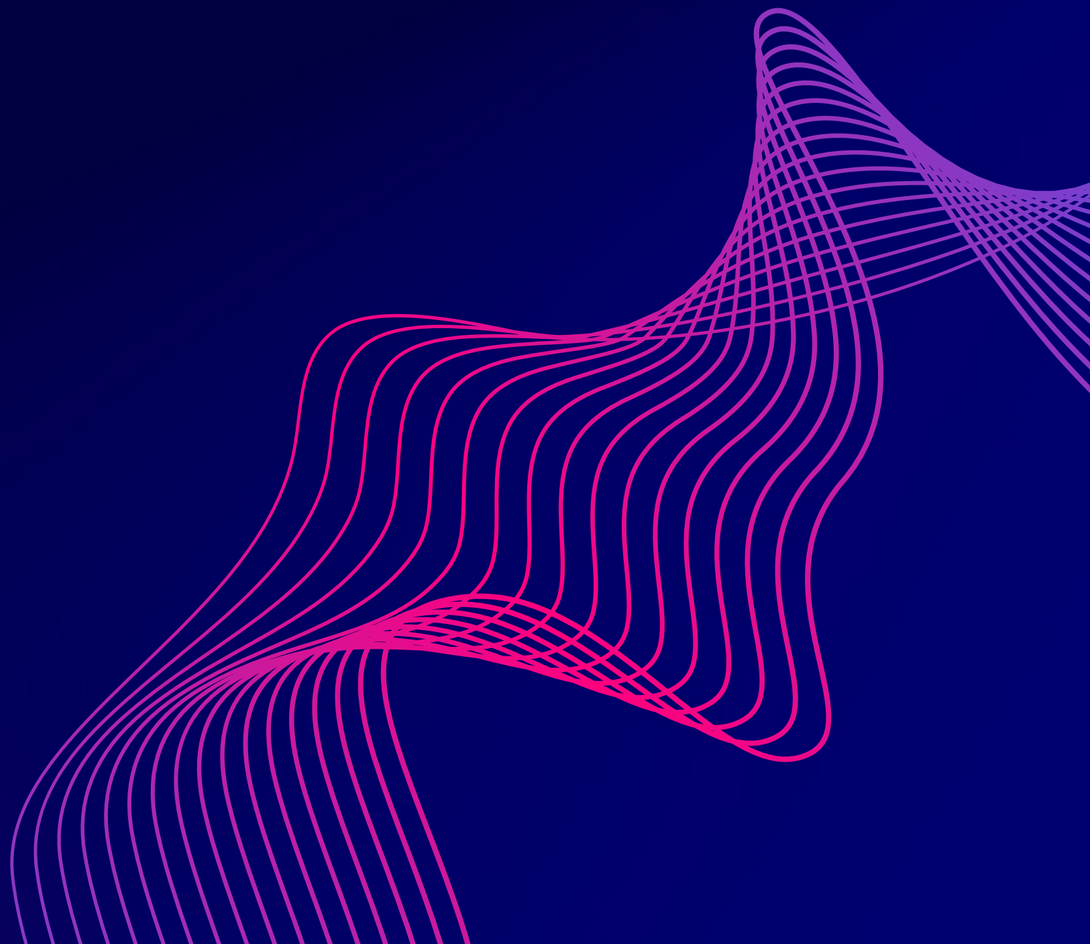
The problem of false positives.

problem # 2

Traditional approaches to automated vulnerability detection are not scalable to large codebases.

problem # 3

Automated vulnerability detection only covers a limited number of vulnerabilities.



Project Statements

- The problem of software vulnerabilities, limited coverage of existing vulnerability detection tools
- The problem of scalability of existing vulnerability detection tools
- The problem of data-driven vulnerability detection
- Using deep learning for vulnerability detection

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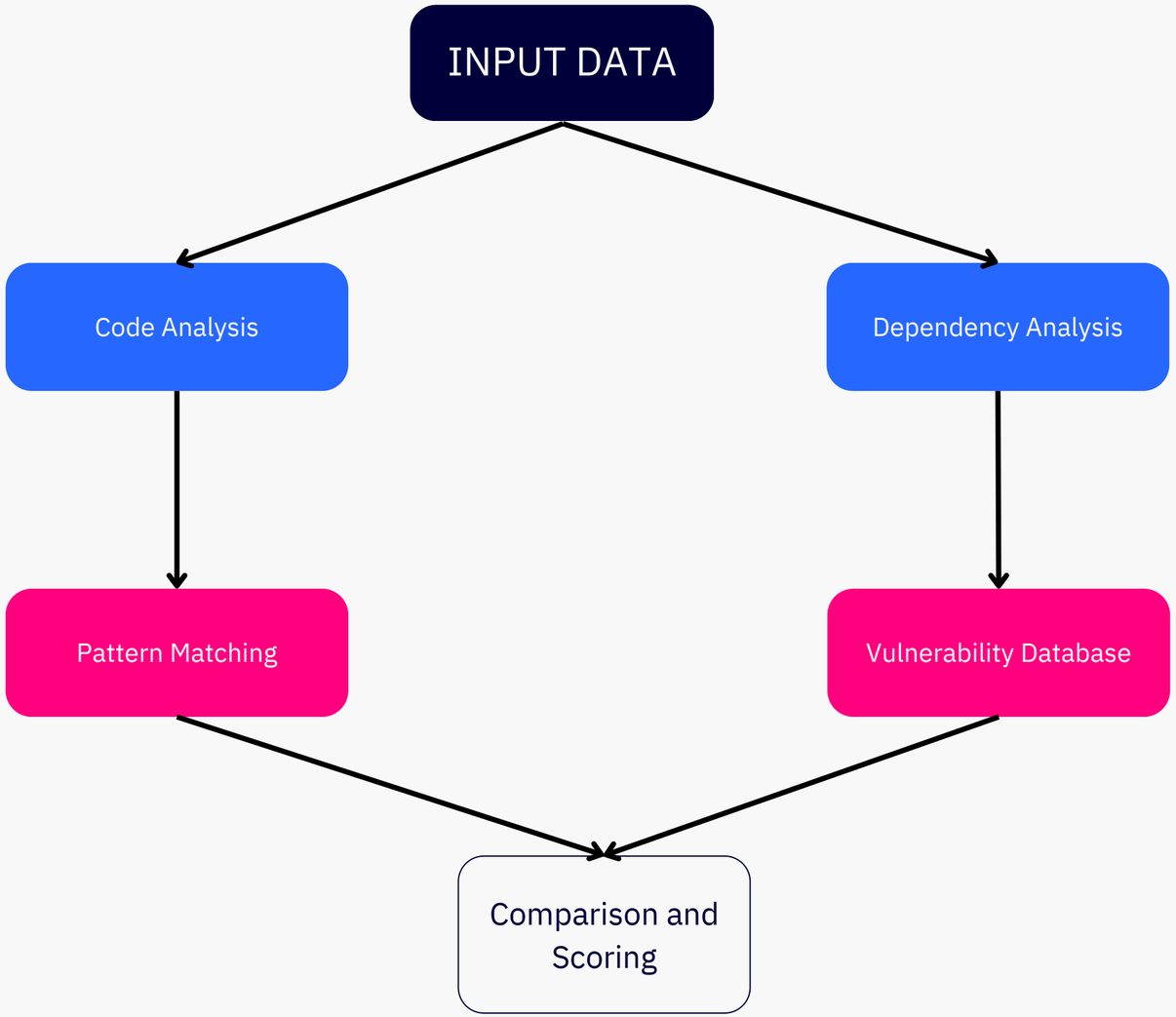
Block Diagram



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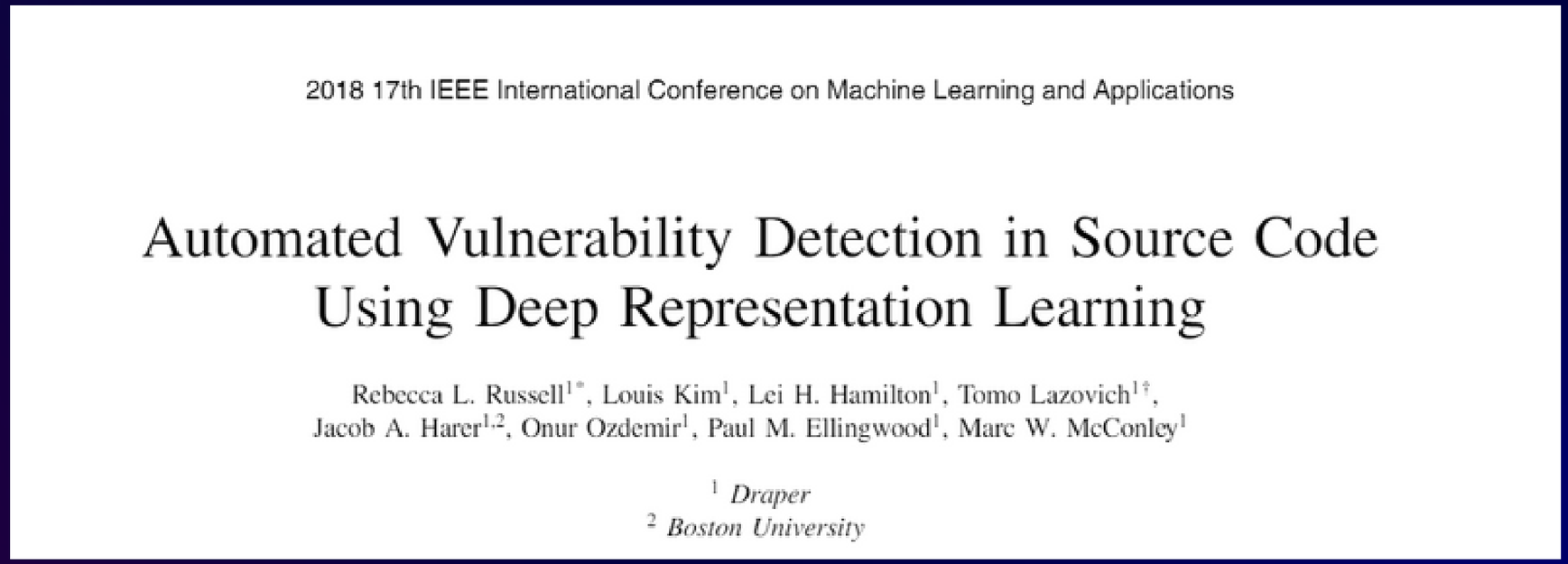
Base Paper



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Automated Vulnerability Detection in Source Code Using Deep Representation Learning

Rebecca L. Russell[1*], Louis Kim[1], Lei H. Hamilton[1], Tomo Lazovich[1†],
Jacob A. Harer[1,2], Onur Ozdemir[1], Paul M. Ellingwood[1], Marc W. McConley[1]

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Link : subheadinghttps://www.researchgate.net/publication/330475443_Automated_Vulnerability_Detection_in_Source_Code_Using_Deep_Representation_Learning

References

1	MITRE, Common Weakness Enumeration. https://cwe.mitre.org/data/index.html
2	T. D. LaToza, G. Venolia, and R. DeLine, “Maintaining mental models: A study of developer work habits,” in Proc. 28th Int. Conf. Software Engineering, ICSE ’06, (New York, NY, USA), pp. 492–501, ACM, 2006.
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4	C. Foxx, “Cyber-attack: Europol says it was unprecedented in scale.” https://www.bbc.com/news/world-europe- 39907965, 2017

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