

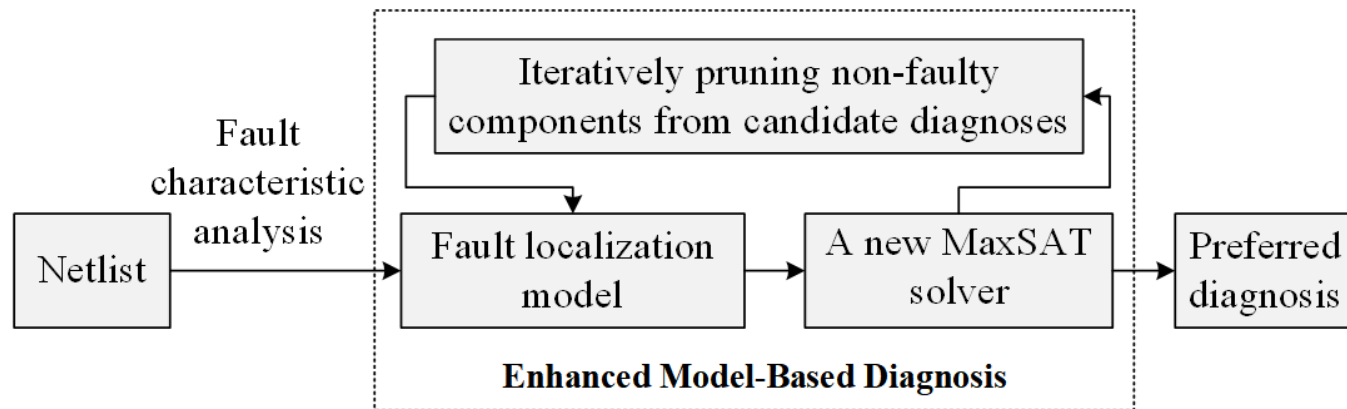
# Towards Preferred Diagnoses through Local Search MaxSAT

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# Problems & Ideas

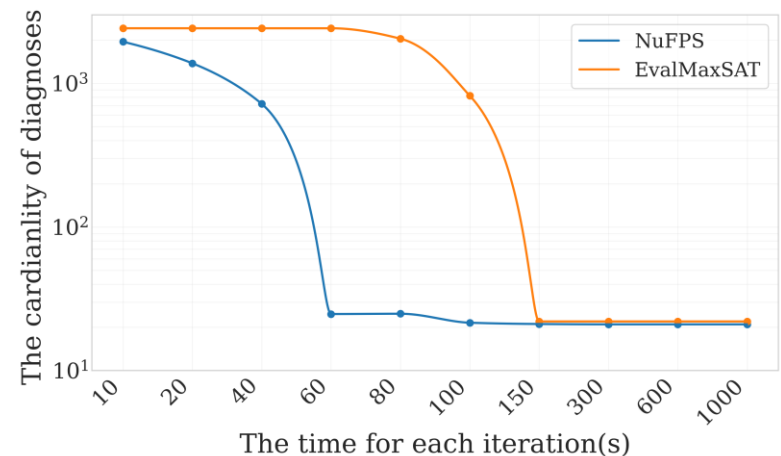
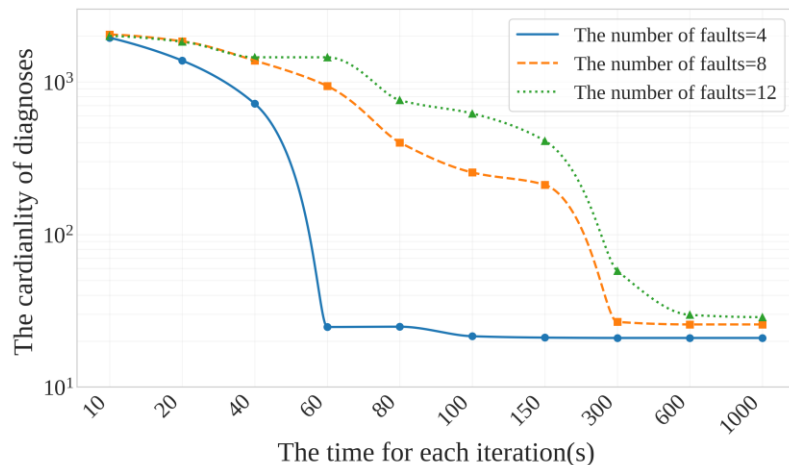
- Problems of conventional model based diagnosis approaches:
  - Existing MBD methods generate numerous candidate diagnoses without ensuring reliable fault localization.
  - The generation of even a single candidate diagnosis using existing MBD methods is a time-intensive process.
- Ideas: a novel Enhanced Model-Based Diagnosis method, which iteratively refines candidate component sets through iterative applications of our fault localization model.



Overview of enhanced model-based diagnosis. We propose an enhanced MBD algorithm, EMBD, which iteratively refines candidate diagnoses. At its core are: (1) a fault localization model that identifies components with changing output logic, and (2) a novel MaxSAT algorithm, NuFPS, which leverages this model to maximize such changes and effectively prune non-faulty components, leading to the preferred diagnosis.

# Main Contributions

- Contributions:
  - Building a fault localization model designed to facilitate the identification of components whose output logic changes between two different observations;
  - Proposing a MaxSAT algorithm, called NuFPS, which is used iteratively to maximize the number of components whose output logic changes among different observations;
  - Proposing a novel MBD approach based on the fault localization model and NuFPS, to identify the cause of malfunctions by effectively pruning fault-free components from the candidate diagnoses.



Presenting experimental results to demonstrate the effectiveness of the proposed methods in computing accurate diagnoses..