

Constraint Satisfaction Problems

1 Definition

A Constraint Satisfaction Problem (CSP) consists of a set of variables, each with a domain of possible values, and a set of constraints specifying allowable combinations of values.

2 Components

- **Variables:** Entities that need to be assigned values.
- **Domains:** Possible values for each variable.
- **Constraints:** Rules restricting valid assignments.

3 Solution Techniques

Common techniques include backtracking search, forward checking, constraint propagation, and arc consistency algorithms such as AC-3.

4 Applications

CSPs are used in scheduling, planning, resource allocation, and puzzle solving.