

# External Shape Analysis

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- Problem
  - ➔ danglingness may depend on shape invariant
  - ➔ type checks bad at finding shape invariants
- Solution
  - ➔ “*don’t try*”
  - ➔ annotate **data structure** with light-weight **annotations**
  - ➔ discharge **annotations** under **garbage collection**
  - ➔ guess&check finds annotations automatically

# Our Approach

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**SMR impl**  $\models$  **SMR spec**

**Data structure** + **Garbage Collection**  $\models$  **Property**

**Data structure** + **SMR spec**  $\models$  **ABA Freedom**

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**Data structure** + **SMR impl**  $\models$  **Property**