

# SEPO: Using symbolic states to find RISC-V optimizations

## Symbolic Memory

### Algorithms:

$M := \{\}$

load(e):

```
if e is concrete:
    if e not in M:
        M[e] := new_symbol()
    return M[e]
```

else:

```
if  $\exists e'$  in M st  $e \equiv e'$ :
    return M[e']
```

```
M[e] := new_symbol()
return M[e]
```

store(e, v):

```
for e' in M:
    if is_sat(e = e'):
        M -= e'
```

```
M[e] = v
```

### Future Work:

- Synthesize equivalent programs using symbolic states
- Incorporate value liveness using CFA
- Handle control flow

