Toward Hybrid Enforcement of Security Policies in JavaScript Applications

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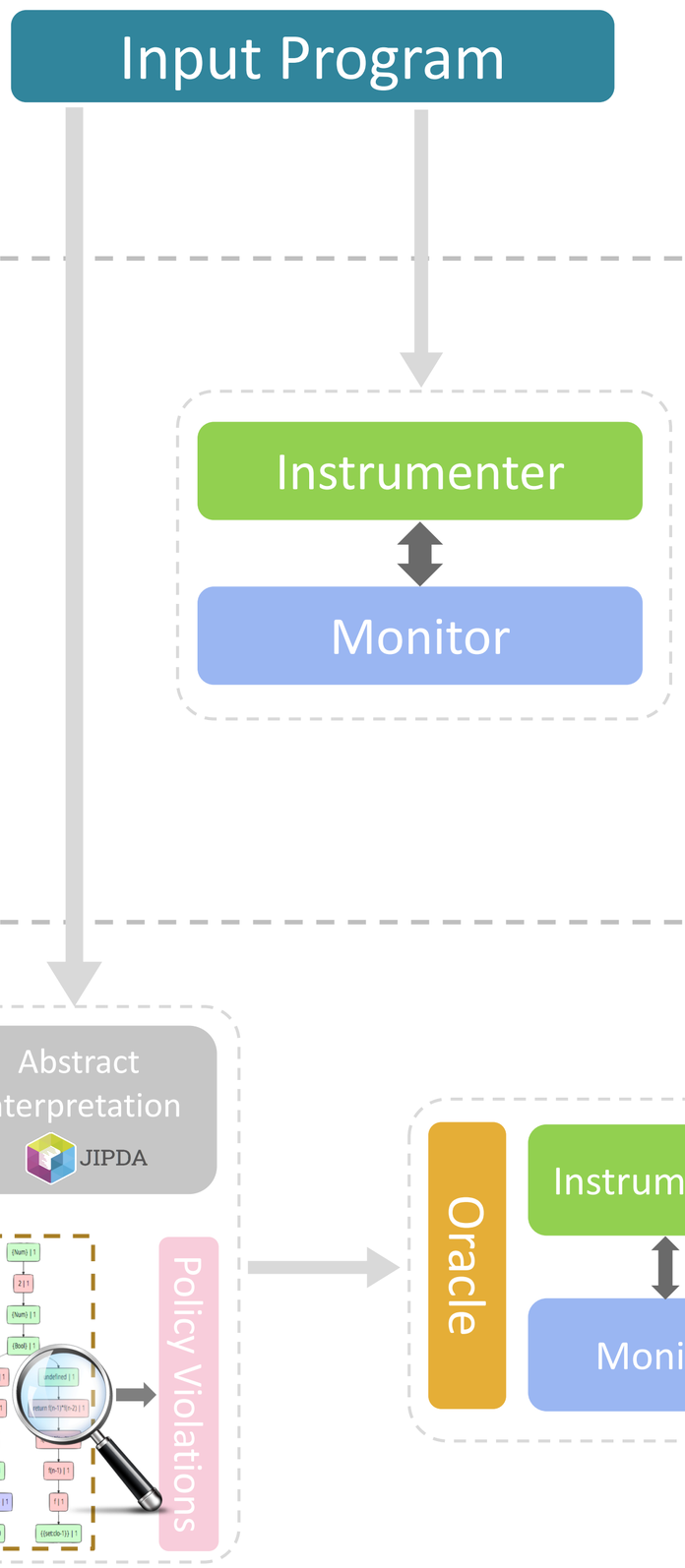
Context

- **Static** policy verification
- **Dynamic** policy enforcement
- **Selective** source code instrumentation

Objectives

- **Hybrid** program verification
- **Reduce** the runtime overhead introduced by monitoring the application

Implementation & Results




```
G.onCall(document.write).deny();
document.write("foo");          //Disallow
document.createElement("div"); //Allow
```

Full Instrumentation

```
ADVICE.invoke(ADVICE.invoke(G, "onCall",
    [ADVICE.get(document, "write", 12)], 10), "deny", [], 9);
ADVICE.invoke(document, "write", ["foo"], 15);
ADVICE.invoke(document, "createElement", ["div"], 19);
```

- Redundant instrumented code
- Redundant policy verifications
- Increased parse and load application time

Selective Instrumentation

```
G.onCall(document.write).deny();
ADVICE.invoke(document, "write", ["foo"], 10);
document.createElement("div");
```

- Less redundant policy checks
- Less instrumented code

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