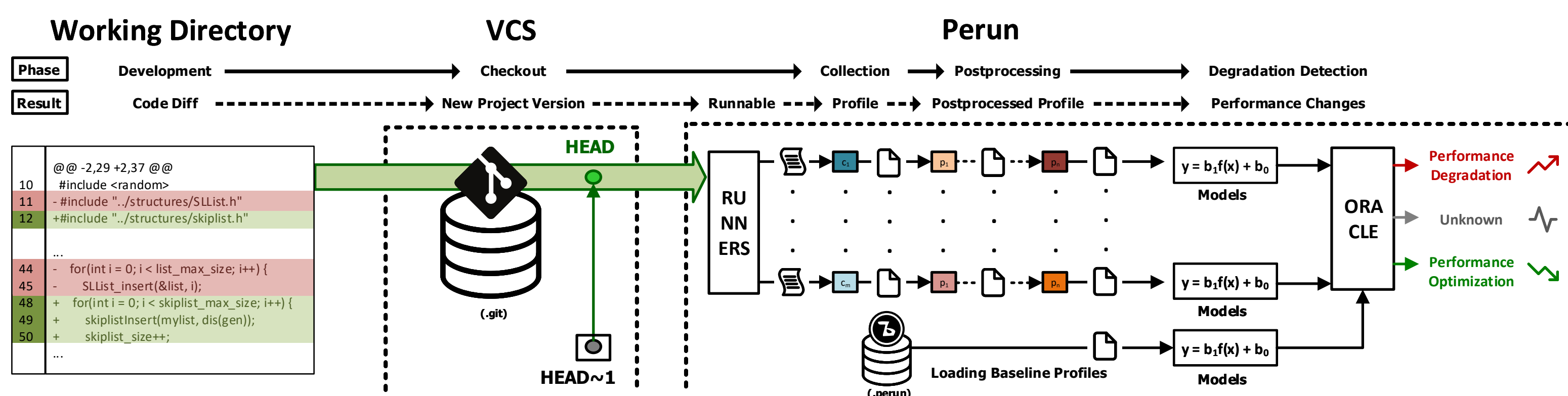


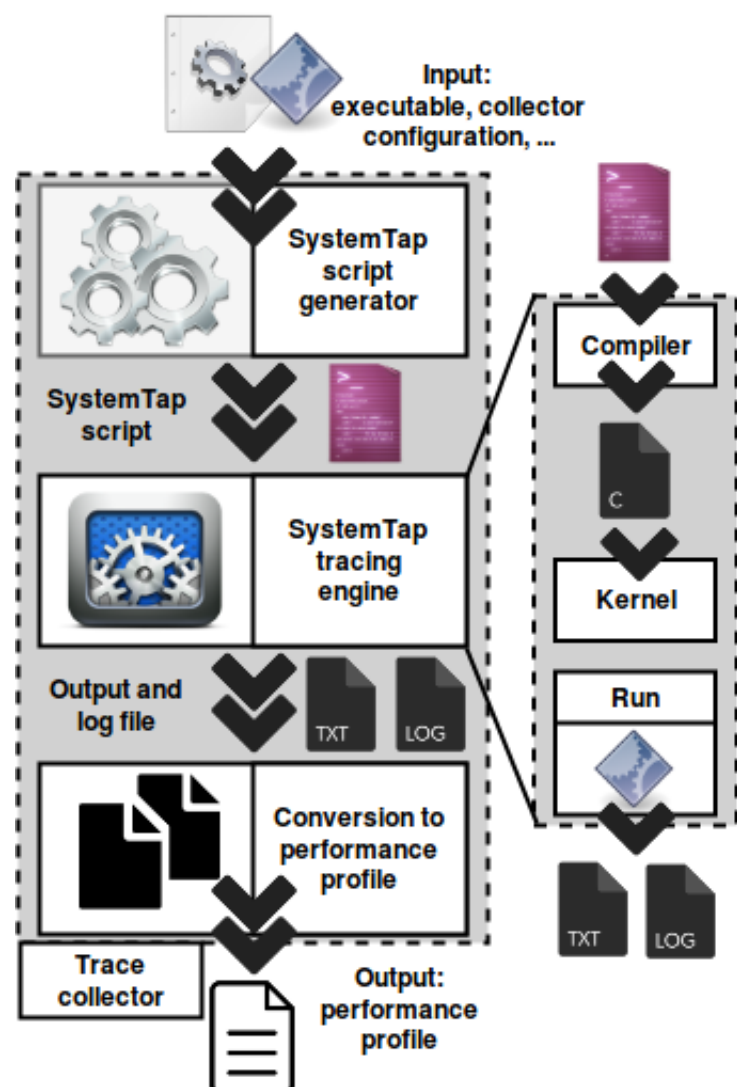
16 TOWARDS THE DETECTION OF PERFORMANCE DEGRADATION

METHODOLOGY OF DETECTING PERFORMANCE CHANGES BETWEEN PROJECT VERSIONS



STEP 1

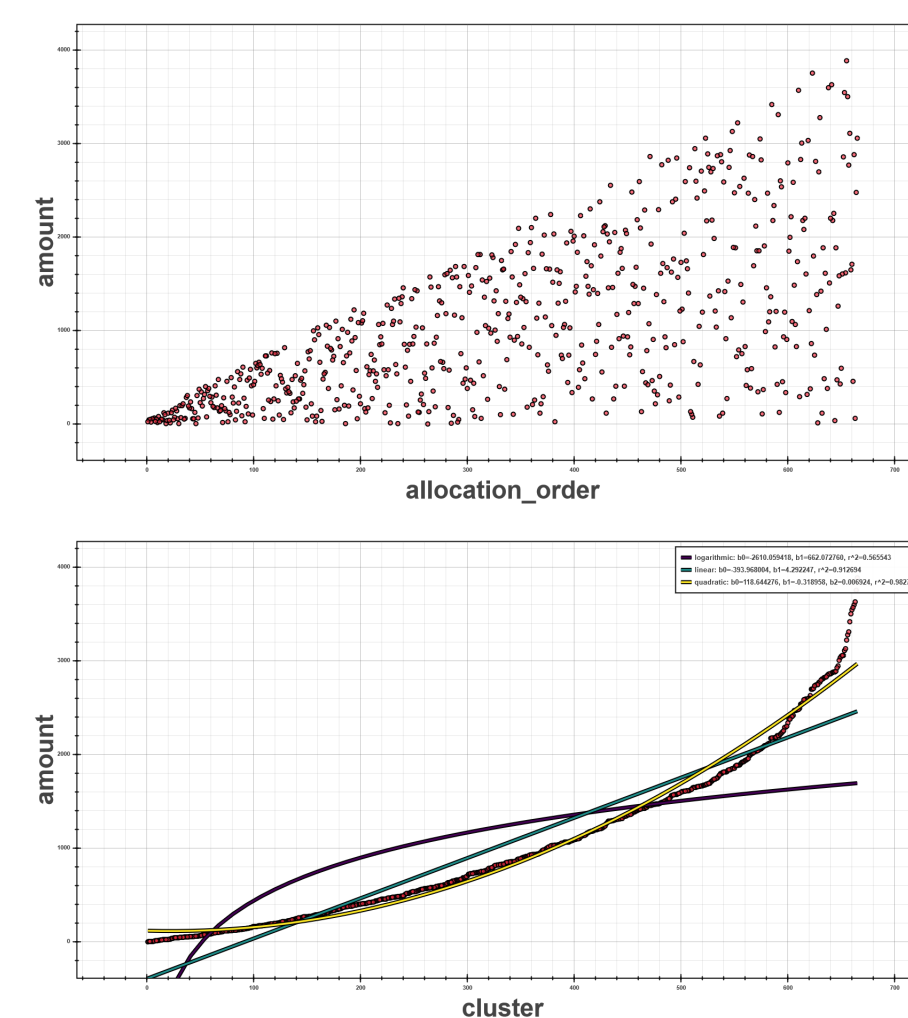
DATA COLLECTION



- Based on SystemTap
- Dynamic tracing
- No annotation needed
- Collects function times

STEP 2

POSTPROCESSING



1. Classify to clusters
2. Estimate models

STEP 3

DIFFERENCE ANALYSIS

```

1 Method check ( $\mathcal{M}_b, \mathcal{M}_t$ )
2   foreach ( $m_b, m_t, (m_b^n, m_t^n) \in \mathcal{M}_b, \mathcal{M}_t$  do
3      $\mathcal{M} = \{m_b, m_t, m_b^n, m_t^n\}$ 
4      $dp_{t-b} = m_t - m_b$ 
5      $dp_{t-b}^n = m_t^n - m_b^n$ 
6      $\epsilon_{rel} = \sum dp_{t-b} / |dp_{t-b}|$ 
7      $\mathcal{M}.add(\text{FindPoly}(dp_{t-b}, 1))$ 
8     for deg = 0 to MAX_DEG do
9        $\rho = \text{FindPoly}(dp_{t-b}^n, \text{deg})$ 
10      if  $\rho[\text{residual}] \leq \xi$  then
11        break
12       $\mathcal{M}.add(\rho)$ 
13   Classify ( $\mathcal{M}, \epsilon_{rel}$ )
    
```

- Based on:
1. coefficients
 2. residuals

- Uses:
- models
 - data points

STEP 4

EVALUATION

#1 \ #2	+c	-c	+n	-n	+n ²	-n ²
cst	OK	OK	c	c	OK	n
lin	OK	OK	n	c	OK	n
log	NO	NO	OK	OK	OK	OK
quad	OK	OK	n	n ²	OK	n
exp	OK	OK	OK	OK	OK	n
pow	OK	OK	OK	NO	OK	OK

Includes error:

- Detection
- Classification

Detection rate:

- 90%

Classification rate:

- 50%

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