Evolutionary selection for regression test cases based on diversity

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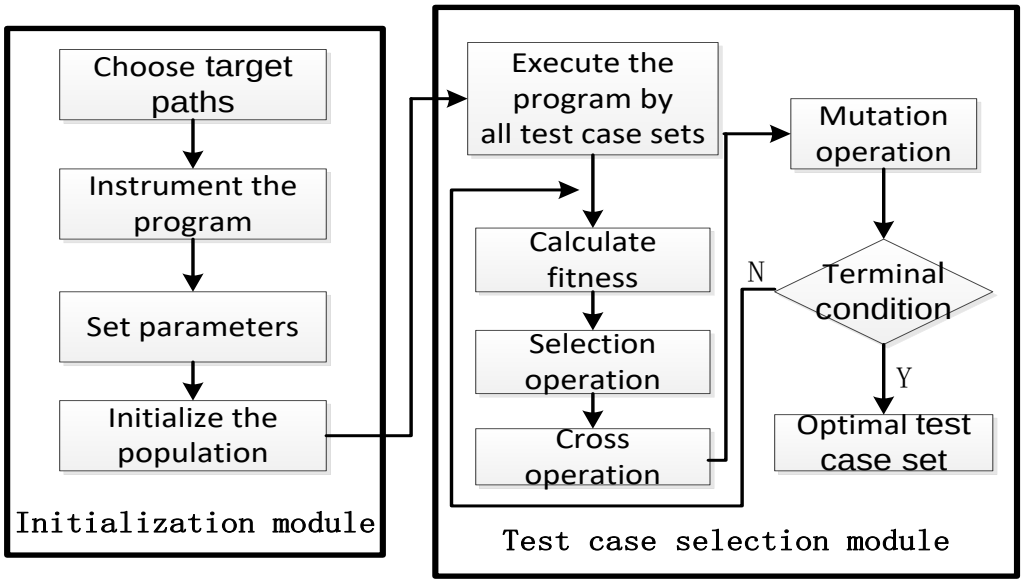
Problems & Ideas

- Problems: The test case selection techniques in regression testing can cause:
  - Unbalanced coverage of program branches
  - Reduction rate and fault detection ability are not high
- Ideas: DRTS: A test case selection method based on diversity
  - Consider coverage balance and path coverage
  - Select test cases using the Genetic Algorithm

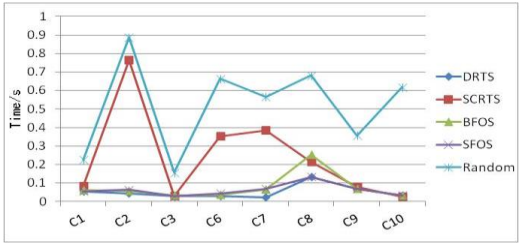


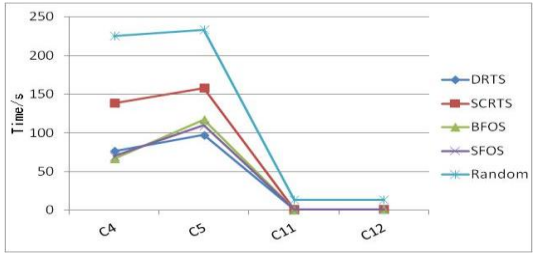
Main Contributions

- **Comparison of coverage balance and fault detection rate**

ID	Coverage balance %					Fault detection rate %				
	DRTS	SCRTS	BFOS	SFOS	Random	DRTS	SCRTS	BFOS	SFOS	Random
C1	**35.4**	37.8	36.9	37.4	56.7	**100**	**100**	**100**	**100**	**100**
C2	**23.2**	51.5	46.5	40.4	87.8	**100**	86.4	**100**	**100**	70.6
C3	**26.7**	32.5	33.4	32.5	46.8	**100**	100	**100**	**100**	74.4
C4	**51.4**	53.8	64.1	60.5	60.2	**86.4**	64.5	81.3	84.4	62.5
C5	**30.7**	62.8	40.8	36.4	47.2	**91.5**	70.2	82.7	86.7	59.4
C6	**41.2**	65	52.9	46.2	71.5	**100**	96.7	96.7	97.3	85.3
C7	**43.7**	56	55.8	51.7	60.2	**100**	95.7	**100**	**100**	82.5
C8	**32.8**	38.4	36.4	38.4	64.7	**100**	**100**	96.4	**100**	56.4
C9	44.5	44.9	**41.8**	43.5	66.7	94.5	**97.4**	90.7	91.5	67.9
C10	**37.7**	42.5	43.2	41.3	59.4	**100**	**100**	**100**	**100**	79.3
C11	**48.8**	55.8	57.6	54.7	62.3	**86.7**	77.4	**86.7**	84.8	62.6
C12	**49.5**	64.5	62.7	64.5	74.9	**92.6**	81.4	82.5	**92.6**	66.9

- **Comparison of run time**





- **Comparison of *F-measure***