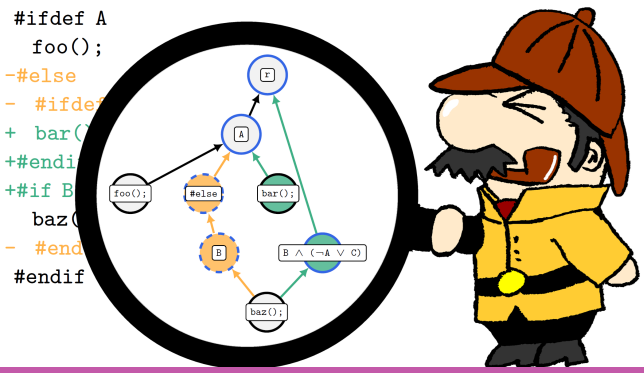

Variability-Aware Differencing with DiffDetective

Paul Bittner, Alexander Schultheiß, Benjamin Moosherr, Christof Tinnes, Sören Viegener, Timo Kehrer, Thomas Thüm | April 12, 2024

PADERBORN UNIVERSITY

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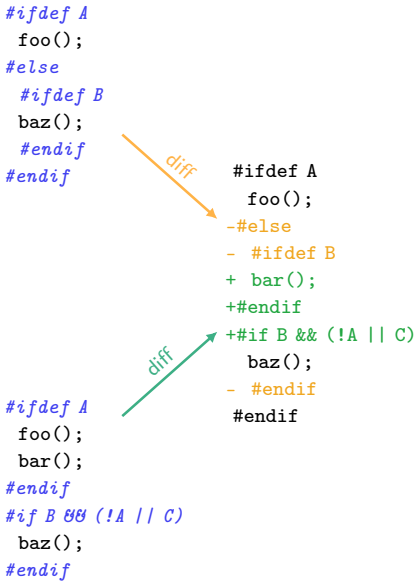
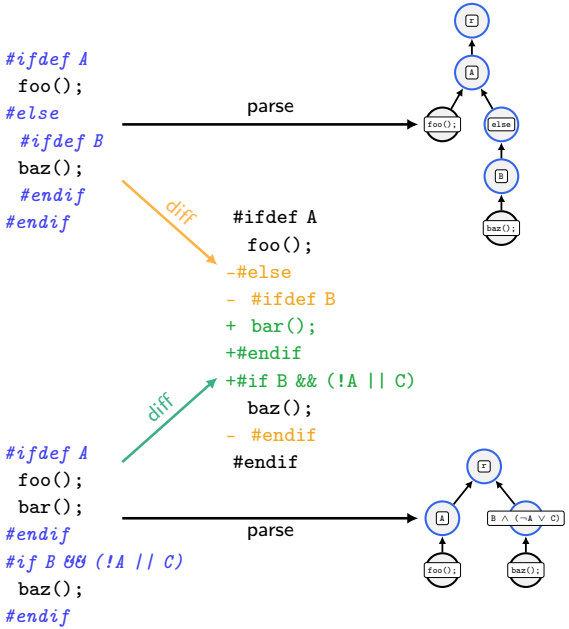
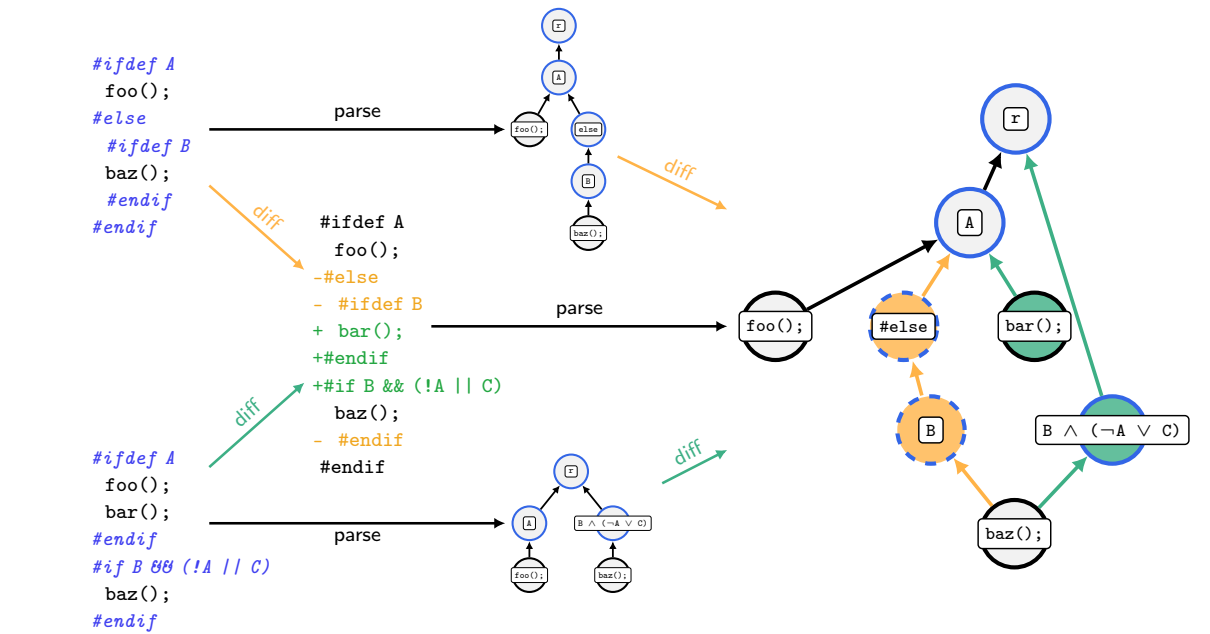
detectivepikachu.pokemon.com

```
#ifdef A
 foo();
#else
 #ifdef B
 baz();
 #endif
#endif
```

```
#ifdef A
 foo();
 bar();
#endif
#if B && (!A || C)
 baz();
#endif
```


#ifdef A
foo();
#else
#ifdef B
baz();
#endif
#endif
diff
#ifdef A
foo();
-#else
- #ifdef B
+ bar();
+#endif
+#if B && (!A || C)
baz();
- #endif
#endif
diff
#ifdef A
foo();
bar();
#endif
#if B && (!A || C)
baz();
#endif


#ifdef A
foo();
#else
#ifdef B
baz();
#endif
#endif
parse
true
A
foo();
else
B
baz();
diff
#ifdef A
foo();
-#else
- #ifdef B
+ bar();
+#endif
+#if B && (!A || C)
baz();
- #endif
#endif
diff
#ifdef A
foo();
bar();
#endif
#if B && (!A || C)
baz();
#endif
parse
true
A
B ∧ (¬A ∨ C)
foo();
baz();


#ifdef A
foo();
#else
#ifdef B
baz();
#endif
#endif
parse
r
A
foo();
else
B
baz();
diff
#ifdef A
foo();
-#else
- #ifdef B
+ bar();
+#endif
+#if B && (!A || C)
baz();
- #endif
#endif
parse
foo();
#else
bar();
A
B
B ∧ (¬A ∨ C)
baz();
r
diff
#ifdef A
foo();
bar();
#endif
#if B && (!A || C)
baz();
#endif
parse
r
A
B ∧ (¬A ∨ C)
foo();
baz();
diff

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Lift operations on SPLs to operations on *edits* to SPLs (e.g., partial configuration, feature tracing), Potential use cases:

- feature-aware commit untangling
- patch backporting
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- ...

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Generate evolution histories of single variants. (see talk of Alex)

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Higher-Order Tree Differencing [TODO]

Diffs of Diffs of Diffs ...

DiffDetective

https://variantsync.github.io/DiffDetective

DiffDetective Demo

https://github.com/VariantSync/DiffDetective-Demo

References

Bittner'22 *Classifying Edits to Variability in Source Code, ESEC/FSE'22*

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Güthing'24 *Explaining Edits to Variability Annotations in Evolving Software Product Lines, VaMoS'24*

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