Contextual Typing

Xu Xue, The University of Hong Kong

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TYPE INFERENCE AND WHAT WE BELIEVE

- → Having reasonable and meaningful annotations is good.
- → Local information is good.
- → Having guidelines for langauge designers and programmers is good.
- → Scalabilities are necessary.
- → Implementation can be easily derived.

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- Types are propogated to neighbouring expressions;

BIDIRECTIONAL TYPING: PROBLEMS STATEMENT

- → Trade-off between expressive power and backtracking;
  - → more expressive, less syntax-directness;
  - → all-or-nothing inference strategy;
- → Unclear annotatability and rule duplication;
- → Inexpressive subsumption.

BALLOON

```
exclaim True
```

```
exclaim :: Show a ⇒ a → String
exclaim x = show x ++ "!"
```

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→ $\Gamma \vdash \Sigma \Longrightarrow e \Longrightarrow A$

Context: precisely captures the information of surrounding context

RECAP

→ Contextual typing is a lightweight approach to type inference

  → that exploits partially known contextual information;

→ It enables several improvements over bidirectional typing

  ① fewer annotations are required, achieved without resorting to backtracking
  ② annotatability becomes clearer
  ③ more powerful subsumption rule