Cases for Lessons: Integrated CBR

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Overview

- Comparing cases and lessons
- Integrated CBR: Goals and examples
- Key future issues

Comparing Cases and Lessons

- Commonalities:
  - Both record experiences and results
  - Storage of both is motivated by expected usefulness (but lesson storage is more stringent)
- Differences:
  - Interactivity: Lessons involve human experiences and influence human actions; cases need not.
  - Lazy learning: CBR is always lazy
  - Specificity: Cases are concrete

Distinguishing Features Suggest Points for Case-Based LL Research

- Interactivity: Need to integrate knowledge capture and access into human tasks
- Lazy learning: Need to support user at application time
- Specificity: Need context-relevant retrieval and presentation to focus on the right features

Goals of Integrated CBR

- To provide automatic experience capture and proactive retrieval.

  Beyond integrating into the task process, integrate into the *tools* used.

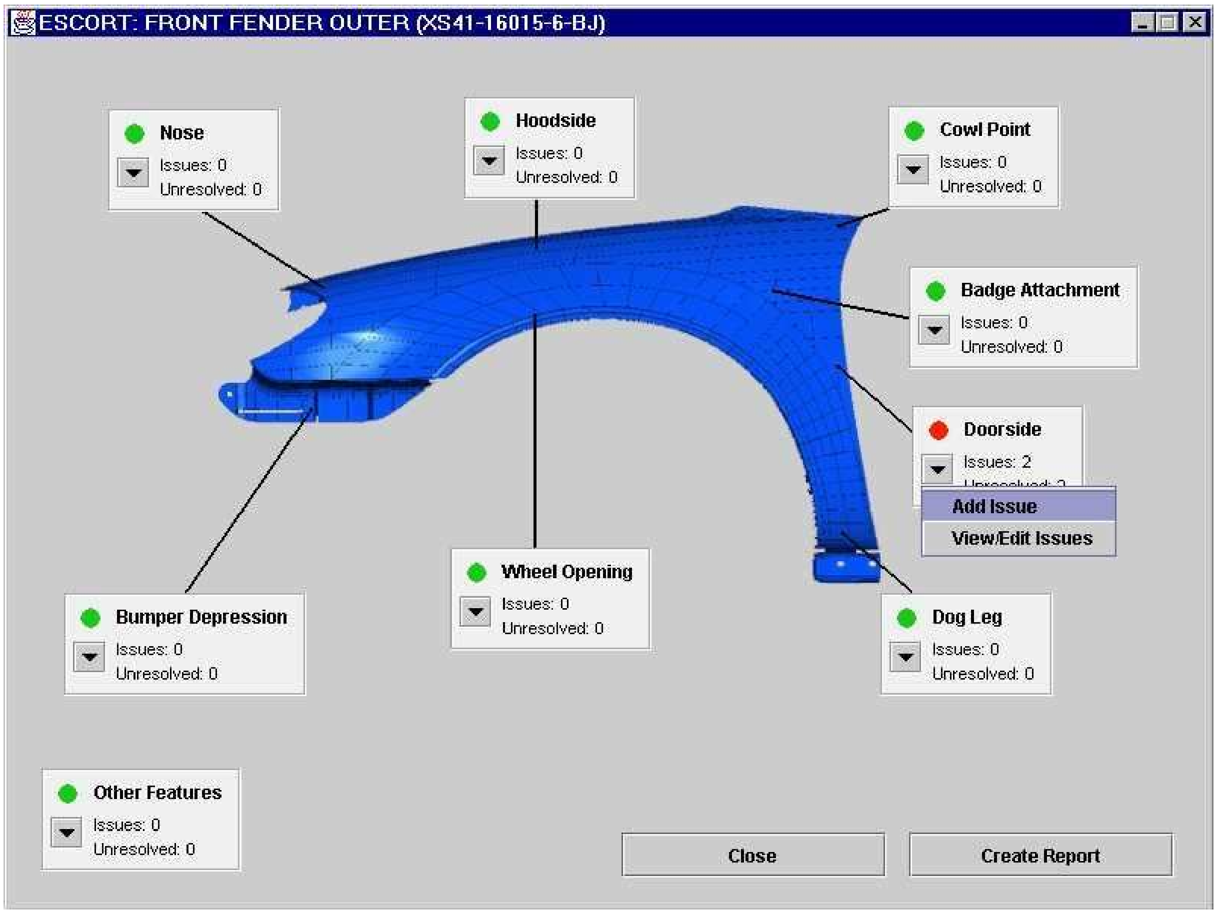
- To aid users by automatically drawing on multiple information sources to aid case application

- To provide on-target case retrieval and presentation with task- and context-sensitive mechanisms

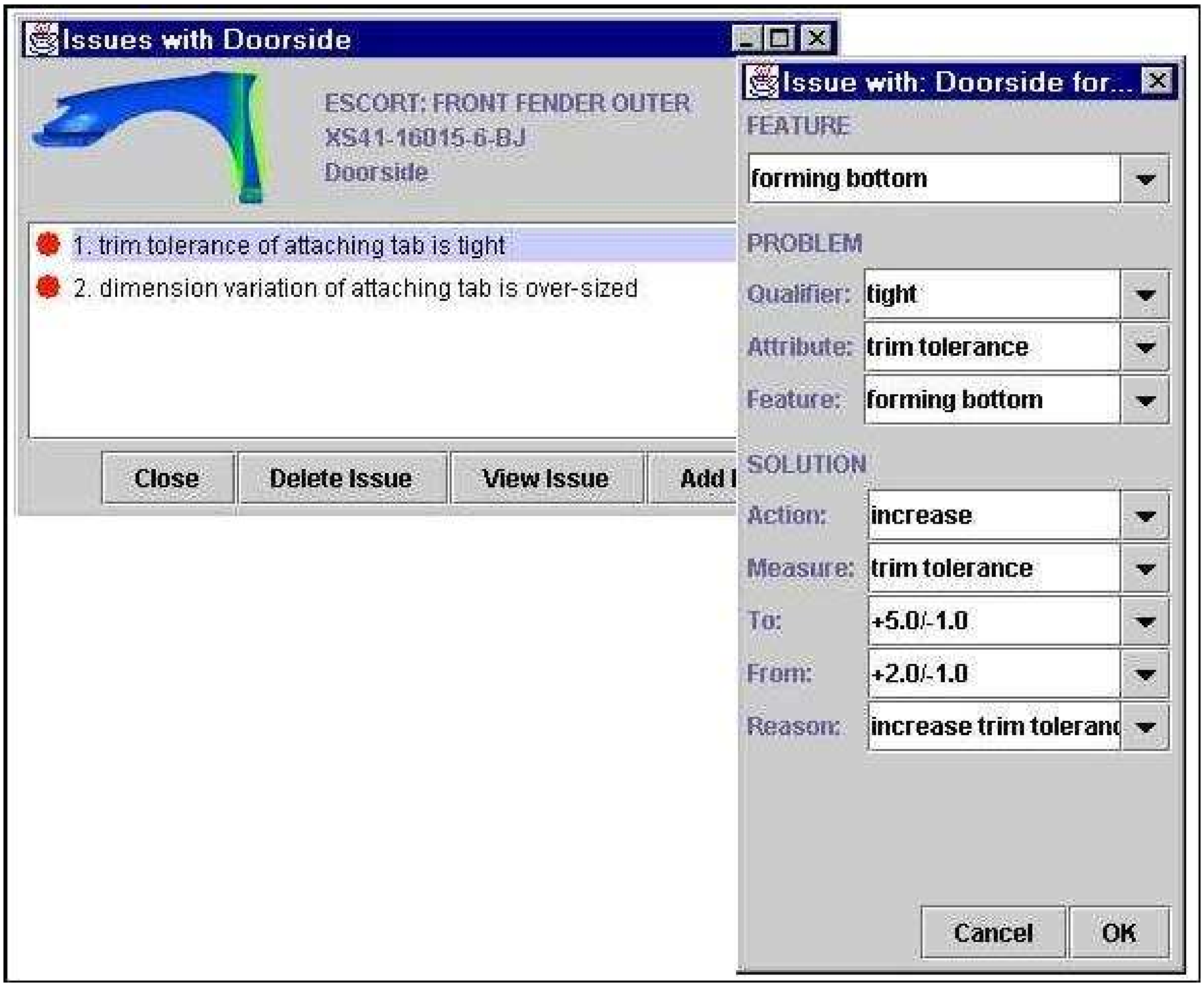
Example 1: The Stamping Advisor

Joint work with Larry Birnbaum, Kristian Hammond, Cameron Marlow, and Hao Yang. Task domain is feasibility analysis for stamped metal parts.

Providing relevant cases as the user needs them:



Capturing cases as a byproduct of the engineer's task:



Automatically forming support queries to web sources:

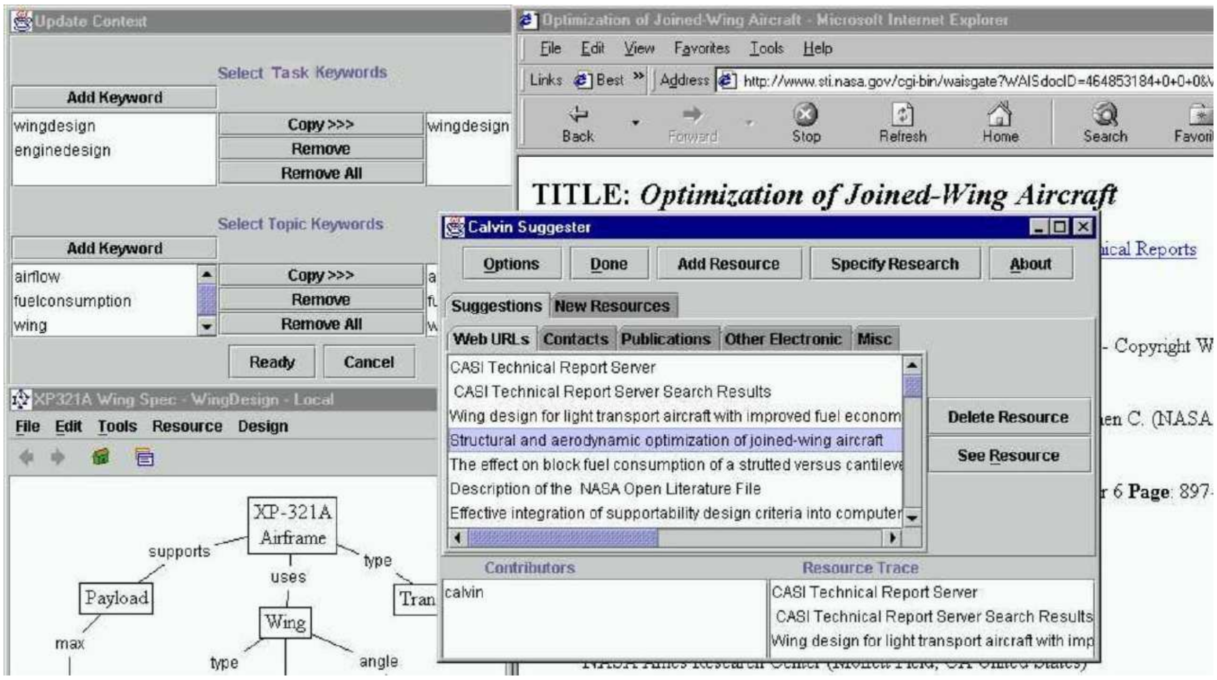
Example 2: CALVIN

Joint work with Travis Bauer and Ana Maguitman.

Task domain is aerospace research. Manages lessons both about the domain and about how to find good information (e.g., on the web):

- Monitors the browsing process and automatically records cases for sources consulted in particular task contexts
- Aids re-application with facilities for annotations and concept mapping
- Proactively suggests resources as the user browses

CALVIN Screens



Details and demos at lunch today!

Future Issues

Key research areas involve integrating case-based LL systems into the environments in which they're used, including integrations with:

- High-level task processes and needs
- User interactions with lower-level tools
- External sources of information and support

References

- Stamping Advisor: “Integrating Information Resources: A Case Study of Engineering Design Support,” by Leake, Birnbaum, Marlow, & Yang. *Proceedings of ICCBR-99.* Springer-Verlag, Berlin. http://www.cs.indiana.edu/~leake/papers/a-99-05.html

- CALVIN: “Capture, Storage and Reuse of Lessons about Information Resources: Supporting Task-Based Information Search,” by Leake, Bauer, Maguitman & Wilson. *Proceedings of the AAAI-00 Workshop on Intelligent Lessons Learned Systems.* AAAI Press, Menlo Park, 2000. http://www.cs.indiana.edu/~leake/papers/a-00-01.html.