Semi-Automatic Generation of Test Cases by Case Morphing
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Test Case Generation & Agile Development
- Validation and maintenance of knowledge systems is still a critical issue
- Agile development methodologies claim to build rapidly systems that are maintainable
- They emphasize the application of a test-first approach: Write test cases before implementing the functionality (i.e. adding new knowledge)

Agile Development Methodology

Method: Case Morphing
- Expert creates typical cases by hand
- An additional number of (diverse) cases is generated by morphing these typical cases
- Morphing a case: Slightly changing the values of the input values contained in the case
- Background knowledge is applied for the creation of more meaningful cases (guiding the morphing process)
- Iterative process: If knowledge coverage is insufficient, then morphing process is repeated

There exist various methods for the generation of test cases, e.g. (Knauf 2000), (Barr 1999), (Gupta & Biegel 1990)
- However, automatic methods for test case generation are not applicable since they use the knowledge for the generation process (contradicts the test-first approach)
- Manual acquisition of test cases is too time-consuming
- Solution: Semi-automatic generation

Conclusion
- Novel method creates cases independent of the knowledge acquisition process
- Such a creative approach is not doomed to re-implement incorrect knowledge possibly contained in the knowledge base, but may detect it
- The morphing method is not performed as a single run but is an iterative process in order to achieve a sufficient test case coverage
- Evaluation with medical consultation system: successful generation of cases by 3 iterations (incl. slight adaptation of some generated cases)