**Introduction**

- **Model Driven Development (MDD)** places models at the heart of all software development processes.
- Methods to describe, control, and verify the evolution and manipulation of models are thus urgently required.
- The theory of **graph transformation** provides a rule-based approach to manipulate graphs.
- However, graph rewriting rules are **hard to get right** without adequate tool support.
- The **Operation Recorder** provides the required tool support, but lacks the required **formal background**.
- If an **alignment between the concepts** provided by the Operation Recorder and those provided by the theory of graph transformation is achieved, we’re one step closer to our goal!

**Running Example**

**Pull-Up Field Refactoring**

```
Employee
+ name: EString
```

```
SalesPerson
+ name: EString
```

```
Engineer
+ name: EString
```

Models evolve just like code and may undergo multiple changes during their lifetimes.

**Conceptual Alignment**

**Aim**: Align the concepts provided by the Operation Recorder to those provided by the graph transformation theory.

**Establish a measure of equivalence** to compare the concepts.

**Extend the theory to template graphs**

**Conclusion**

- A **framework capable to transform software models**, i.e., attributed graphs with inheritance, composition, and multiplicities, was gradually established.
- By embedding the Operation Recorder into this framework **standard, optional, and non-existence templates** as well as **negative application conditions** were successively aligned.
- The achieved alignment provides a formal foundation for the Operation Recorder allowing the **verification of and reasoning about the modification it performs**.