People engage in argumentation in daily life with many goals, e.g., persuading other people and accomplishing collaborative tasks. However, such goals are not achieved naturally; indeed, the growing opportunities to engage in argumentation online can exacerbate divisiveness, and the staggering amount of opinions do not necessarily help people make the best judgments. Hence, there is a need for language technologies to understand and process argumentation effectively. These technologies may help us better understand beneficial or harmful moves in argumentation for achieving a communication goal. They may also efficiently analyze what arguments are made for/against different stances, thereby helping people make informed judgments.

This thesis aims to achieve these goals by focusing on **propositions** in argumentation. Specifically, we develop computational methods for analyzing proposition types, identifying pro/counter relations between propositions, and generating propositions for counter-argumentation. Most prior approaches in this field of NLP focus on training machine learning algorithms on large data. This thesis, in contrast, aims to provide more linguistically informed methods, e.g., by drawing upon argumentation theory.

For analyzing proposition types, we present a model to identify proposition types (e.g., comparison, statistics, personal anecdote) from dialogues. Applying this model on four corpora of argumentative dialogue, we analyze what proposition types are common in argumentative dialogue and how these proposition types are associated with various argumentation outcomes.

Propositions not only function individually but also interact with one another to form pro-/counter-arguments. To identify the pro/counter relations between propositions, we present a model to extract asserted propositions in argumentative dialogue, and then propose to use four linguistic mechanisms to identify the pro/counter relations between these propositions.

Based on this understanding, we enrich ongoing argumentation by generating propositions for counter-argumentation. We present two computational models to detect attackable points in arguments, and then propose to use argumentation schemes for generating attacking.