6 Conclusion

We have shown that all characterizations presented in this thesis are equally expressive.

Theorem 4.2.1 and Theorem 4.2.5 show the equivalence of deterministic and non-deterministic finite automata.

Lemma dfa_to_nfa_correct : dfa_lang A =i nfa_lang dfa_to_nfa .

Lemma nfa_to_dfa_correct : nfa_lang A =i dfa_lang nfa_to_dfa .

We have shown that there is an equivalent DFA for every extended regular expression.

Lemma re_to_dfa_correct r: dfa_lang (re_to_dfa r) =i r .

Building on that, we proved the decidability of equivalence of regular expressions in Theorem 4.7.1 with the help of decision procedure for equivalence of finite automata.

Lemma re_equiv_correct r s: re_equiv r s <-> r =i s.

Theorem 4.8.2 shows that we can give an equivalent regular expression for every automaton.

Lemma dfa_to_re_correct: dfa_lang A =i dfa_to_re .