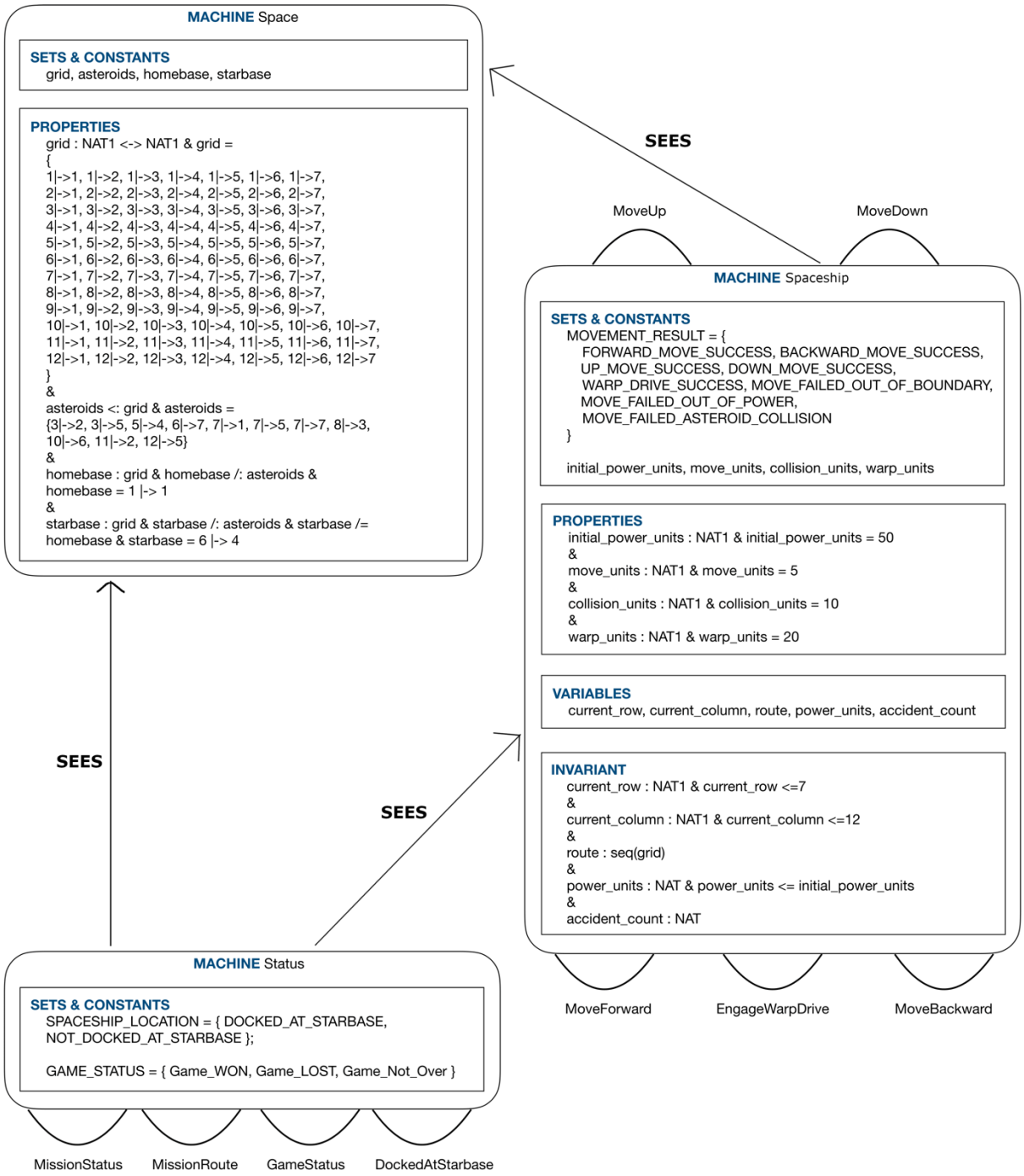

Figure 0.1 Structure diagram

Explanation of state variables

Variable	Explanation
current_row	Row ID of the Spaceship's current location
current_column	Column ID of the Spaceship's current location
route	Route of the spaceship (i.e. empty squares of the space grid, which were visited by the Spaceship)
power_units	Remaining amount of power units in the Spaceship
accident_count	Number of accidents that the Spaceship met with, meanwhile traveling around the space

Explanation of state invariants

Invariant	Explanation
current_row : NAT1	current_row belongs to the built-in typeset, natural numbers, starting with 1. Here, the lower limit of the variable is implicitly implied as 1.
current_row <= 7	current_row can only hold up to the value 7 (upper limit)
current_column : NAT1	current_column belongs to the built-in typeset, natural numbers, starting with 1. Here, the lower limit of the variable is implicitly implied as 1.
current_column <= 12	current_column can only hold up to the value 12 (upper limit)
route : seq(grid)	route is defined as a sequence over the relation, "grid". Reason for selecting a sequence is because we need to record the path which was travelled by the Spaceship in ascending order.
power_units : NAT	power_units belongs to the built-in typeset, natural numbers, starting with 1. Here, the lower limit of the variable is implicitly implied as 0.
power_units <= initial_power_units	power_units variable can't hold a value greater than the value specified by the "initial_power_units" constant. (i.e. upper limit = initial_power_units)
accident_count : NAT	The Spaceship may not encounter with a single accident during the journey, hence natural numbers typeset, starting with 0 has been selected, over the natural numbers typeset staring with 1.