$CirculatingToken_i$ automaton (formal):

Signature:

Input:
- try_i
- $exit_i$
- $receive(\text{“}token\text{”})_{i-1,i}$

Output:
- $crit_i$
- rem_i
- $send(\text{“}token\text{”})_{i,i+1}$

States:

$token\text{-}status \in \{not\text{-}here, available, in\text{-}use, used\}$, initially $available$ if $i = 1$, $not\text{-}here$ otherwise
$region \in \{R, T, C, E\}$, initially R

Transitions:

try_i
- Effect:
  - $region := T$

$crit_i$
- Precondition:
  - $region = T$
  - $token\text{-}status = available$
- Effect:
  - $region := C$
  - $token\text{-}status := in\text{-}use$

$exit_i$
- Effect:
  - $region := E$

rem_i
- Precondition:
  - $region = E$
- Effect:
  - $region := R$
  - $token\text{-}status := used$

$receive(\text{“}token\text{”})_{i-1,i}$
- Effect:
  - $token\text{-}status := available$

$send(\text{“}token\text{”})_{i,i+1}$
- Precondition:
  - $token\text{-}status = used$ or
    - ($token\text{-}status = available$ and $region = R$)
- Effect:
  - $token\text{-}status := not\text{-}here$

Tasks:

Each locally controlled action comprises a task by itself.