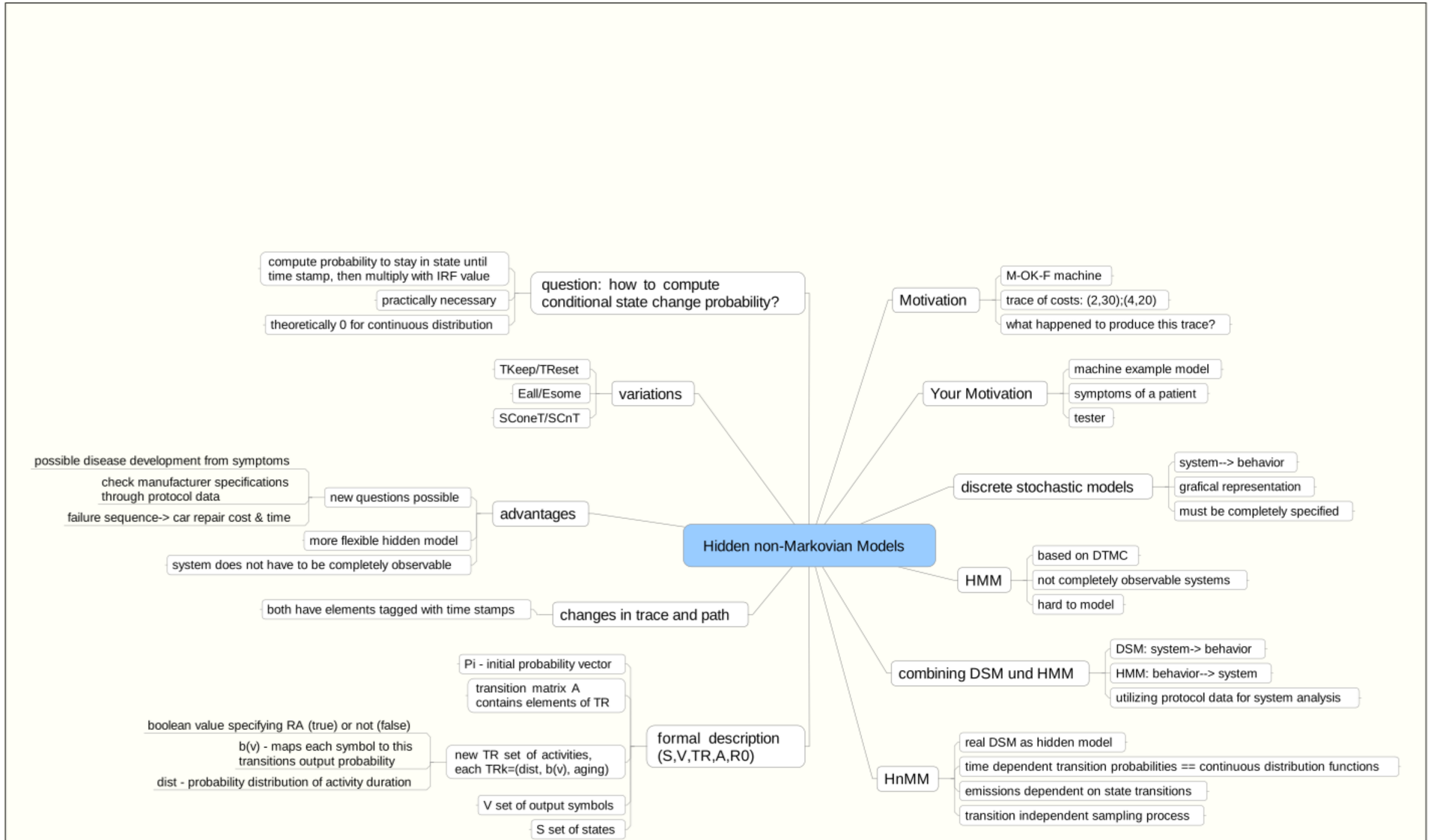
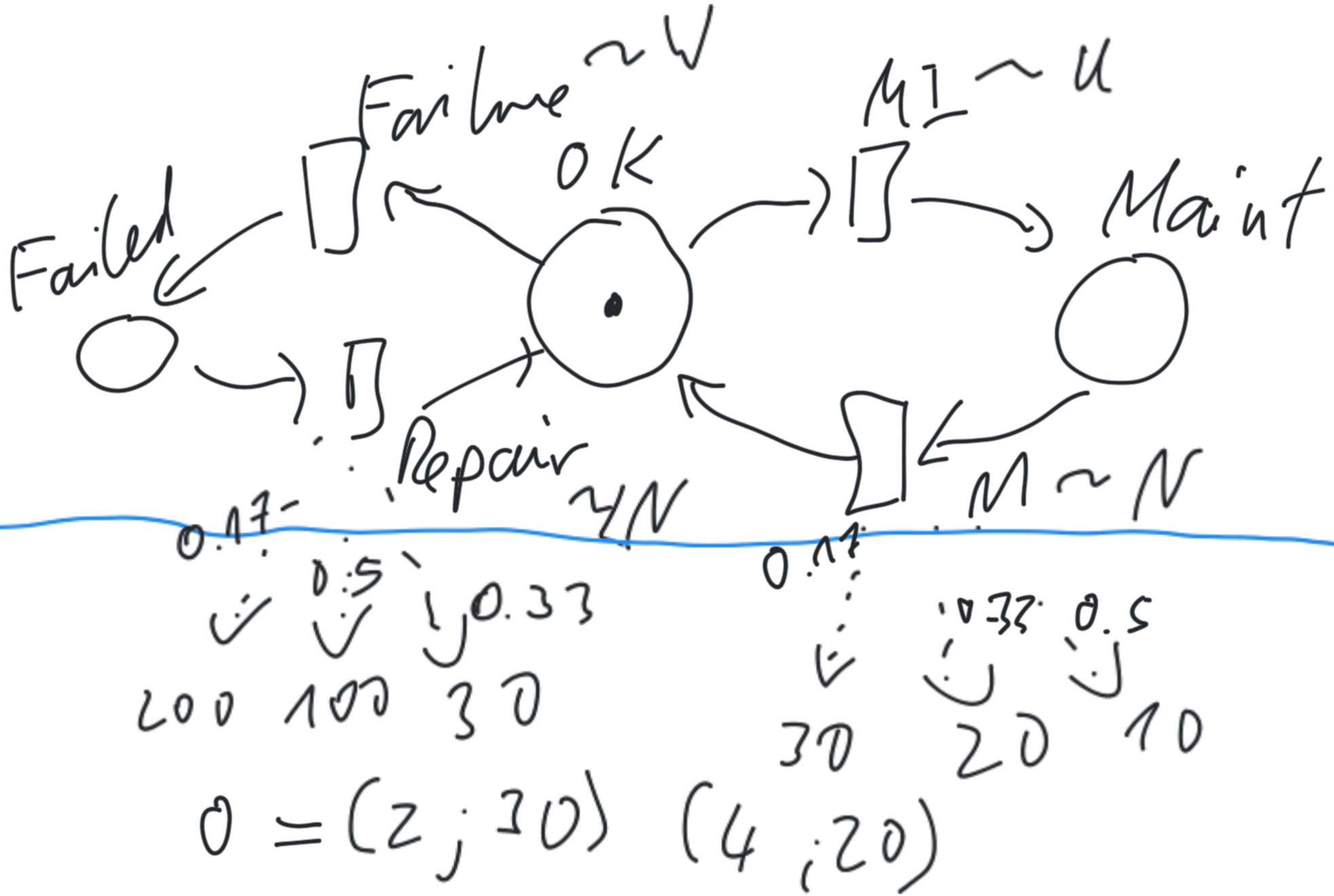
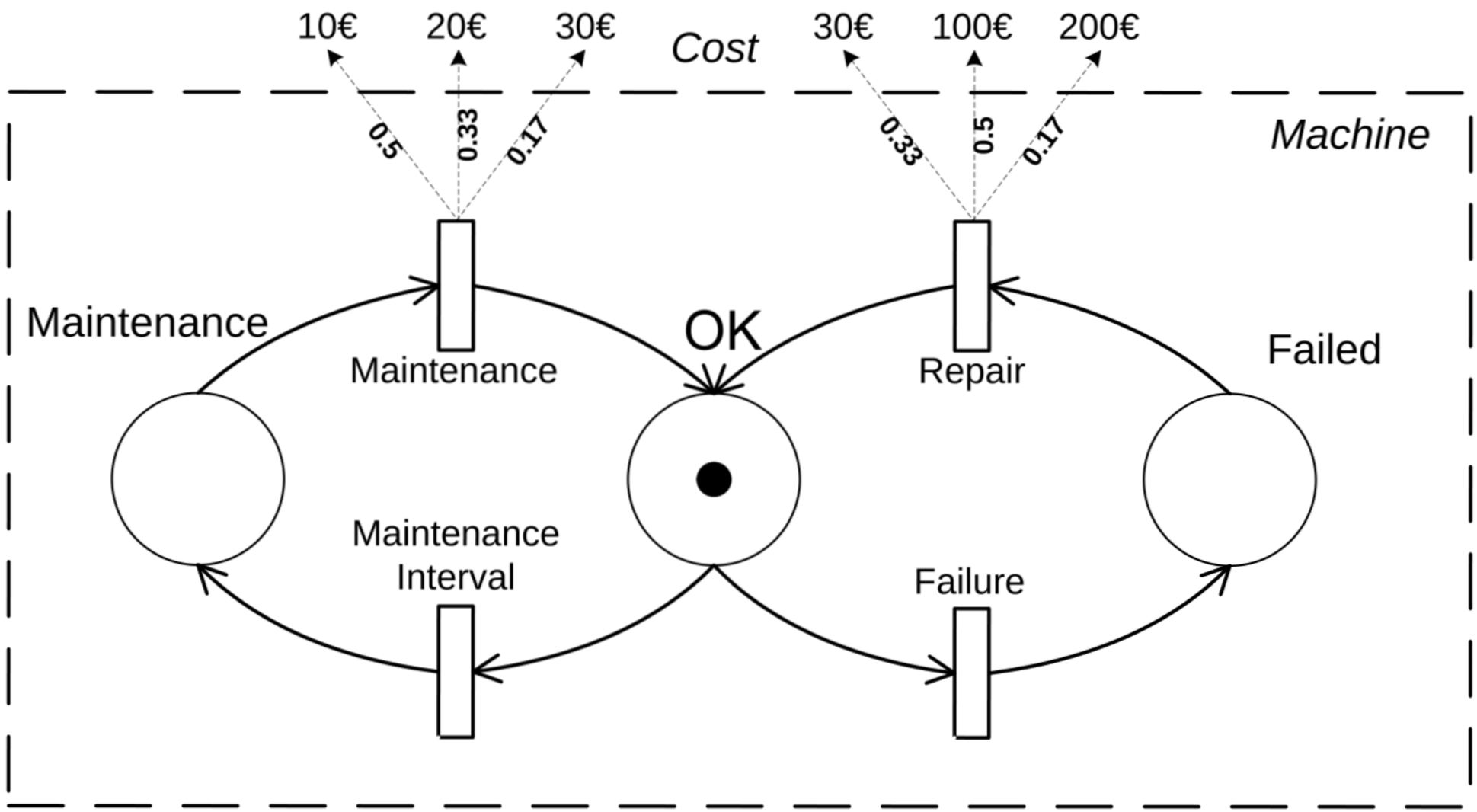
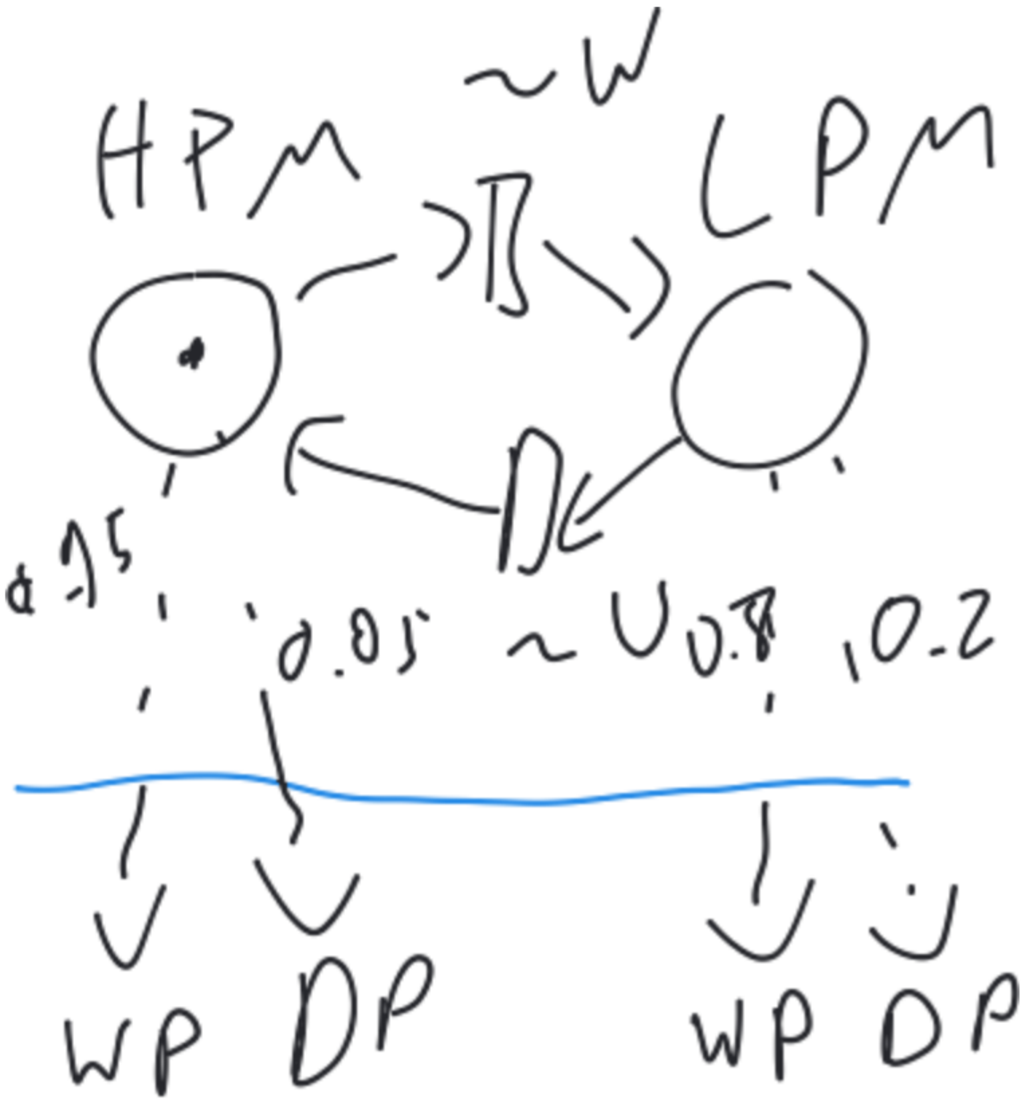


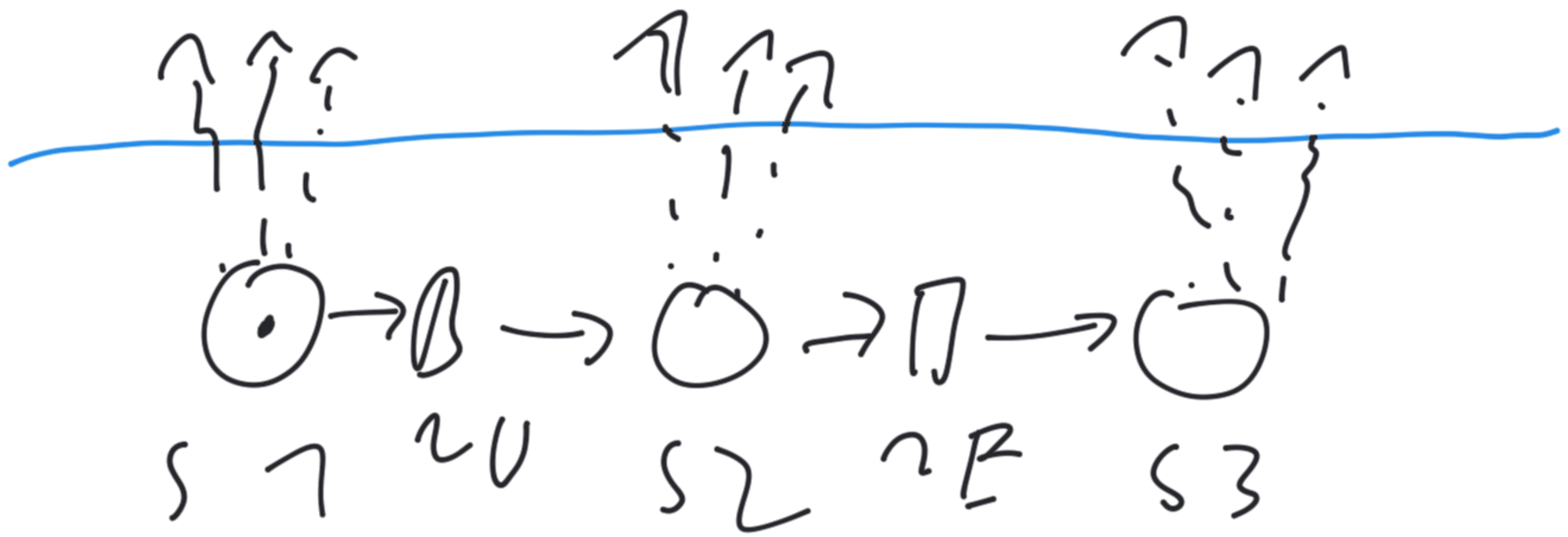
HnMM1.mmap - 26.05.2014 - The Mindjet Team

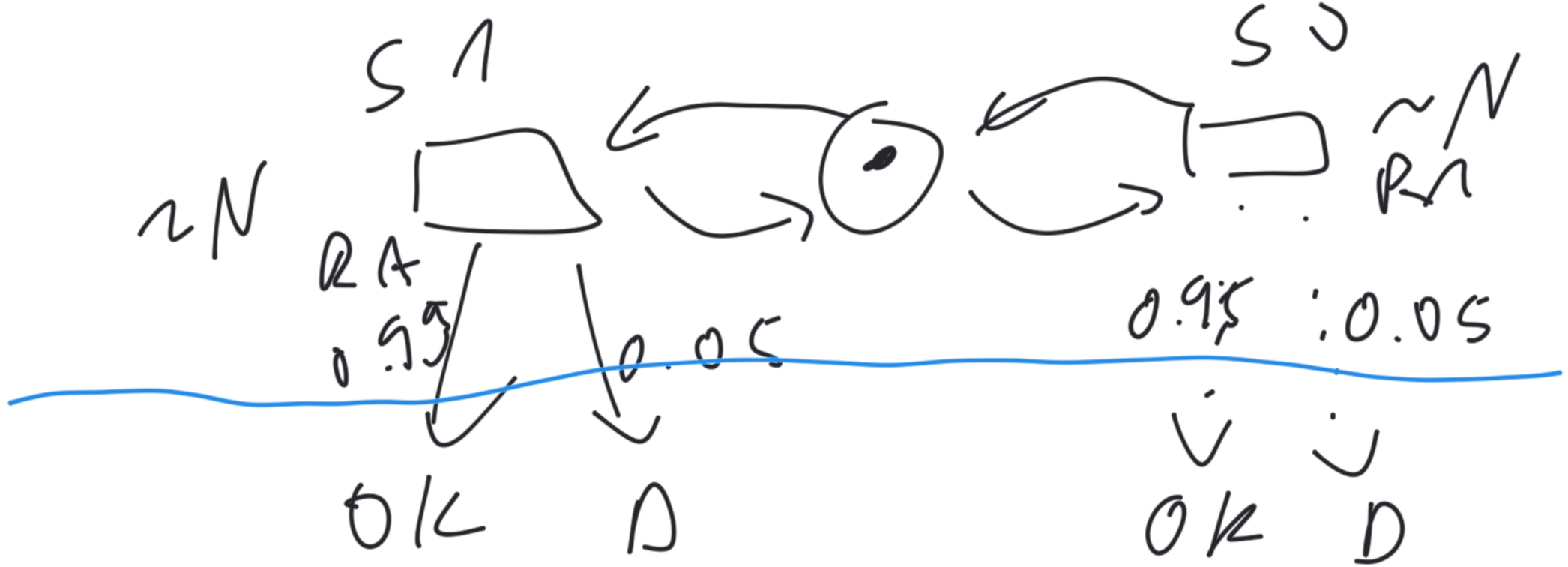
H


Failure ~ V
OK
M1 ~ U
Failed
Maint
Repair
M ~ N
0.17
0.5
0.33
200
100
30
0.17
0.33
0.5
30
20
10
0 = (2 ; 30) (4 ; 20)


10€
20€
30€
Cost
30€
100€
200€
0.5
0.33
0.17
0.33
0.5
0.17
Machine
Maintenance
Maintenance
OK
Repair
Failed
Maintenance
Interval
Failure


~W
HPM
LPM
0.05
~U0.8,0.2
WP
DP
WP
DP


S1
2U
S2
2R
S3


S 1
S 0
~N
RA
0.95
0.05
0.95 : 0.05
OK
D
OK
D

DSM

Comp. obs.

non Markov.

HMM

not comm. obs.

DTMC

System → behavior

behavior ⇒ system

protocol data → system analysis

Hidden non-Markovian Models

HnMM

- DSM as hidden part
- cont. dist. f.
- emissions → trans.
  ↳ ind. sampling

$$fl_n MM = (S, V, TR, A, \Pi)$$

$$S = \{s_1 \dots s_N\}$$

$$V = \{v_1 \dots v_M\}$$

$$TR = \{TR_1 \dots TR_K\}$$

$$TR_k = (dist.\ b(v), aging)$$

$$b(v) : V \to \{0, 1\}$$

$$A = \{a_{ij}\}_{N \times N} \quad a_{ij} \subseteq TR$$

$$O = \{(o_1, e_1) \ldots (o_T, e_T)\}$$

$$Q = \{(q_0, e_0) \ldots (q_P, e_P)\}$$

$$P \geq T$$

$$\lambda = \{A, \Pi\}$$

ISP : $TR = (dist, agly)$ (S, V, TR, A, B, Π)

$$S = \{OK, Maint., Failed\} = \{OK, M, F\}$$

$$V = \{10, 20, 30, 100, 200\}$$

$$TR = \{TR_{MI}, TR_M, TR_F, TR_R\}$$

$$TR_{MI} = (U(a,b), b(v)=0, false)$$

$$TR_F = (W(\alpha,\beta), b(v)=0, false)$$

$$TR_M = (N(\mu,\sigma), b(10)=0.5, b(20)=0.33, b(30)=0.1+, false)$$

$$TR_R = (LN(\mu,\sigma), b(30)=0.33, b(100)=0.5, b(200)=0.17, false)$$

$$S = \{OK, Maint., Failed\} = \{OK, M, F\}$$

$$V = \{10, 20, 30, 100, 200\}$$

$$TR = \{TR_{MI}, TR_M, TR_F, TR_R\}$$

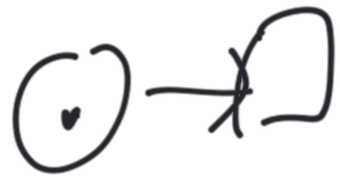
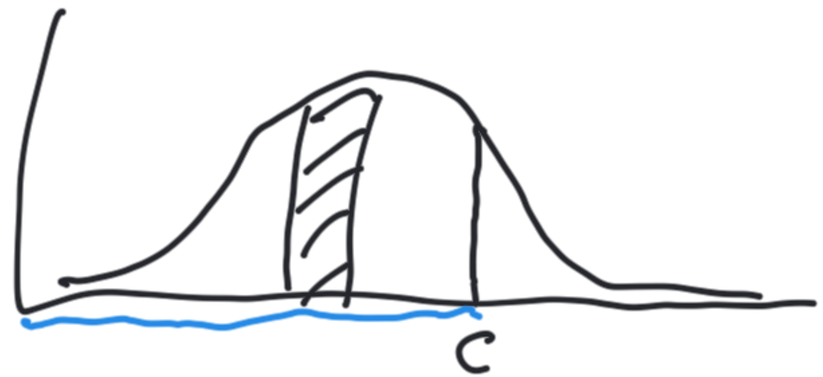
$$A = \begin{bmatrix} \emptyset & TR_{MI} & TR_F \\ TR_M & \emptyset & \emptyset \\ TR_R & \emptyset & \emptyset \end{bmatrix}$$

$$\Pi = (1, 0, 0)$$

① sconeT | scnT

② Eall | Esome

③ Tkeep | Treset



(2,30) (4,20)