

Markoviaanse imprecieze sprongprocessen: grondslagen, algoritmen en toepassingen

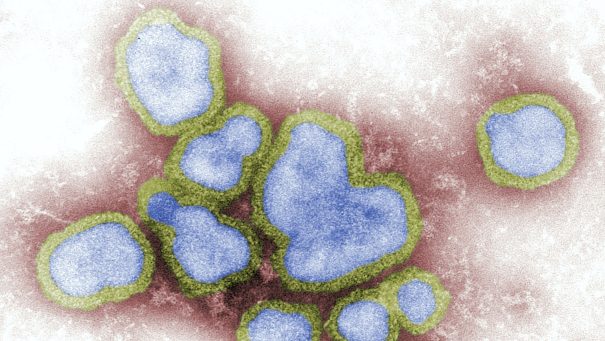
Alexander Erreygers

Finale -prijs 2022

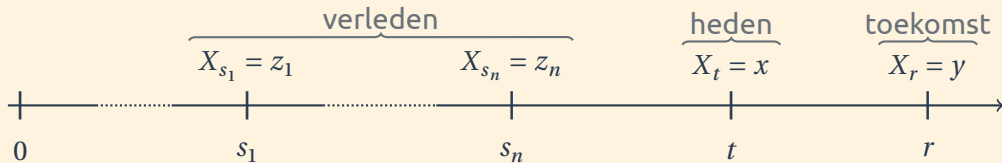
Foundations Lab – Vakgroep Electronica en Informatiesystemen

Faculteit Ingenieurswetenschappen en Architectuur – Universiteit Gent

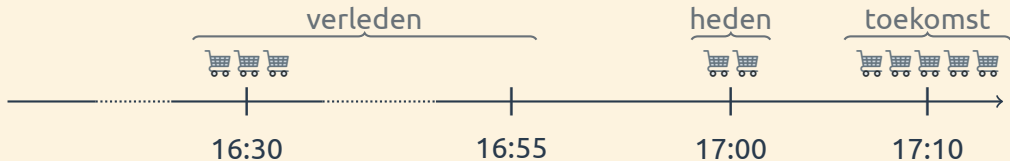




$$P(X_r = y \mid X_t = x, X_{s_1} = z_1, \dots, X_{s_n} = z_n)$$



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$$Q(x, y \mid t, X_{s_1} = z_1, \dots, X_{s_n} = z_n) = \frac{d}{dr} P(X_r = y \mid X_t = x, X_{s_1} = z_1, \dots, X_{s_n} = z_n) \Big|_{r=t}$$

$$Q(x, y \mid t, X_{s_1} = z_1, \dots, X_{s_n} = z_n) = \frac{d}{dr} P(X_r = y \mid X_t = x, X_{s_1} = z_1, \dots, X_{s_n} = z_n) \Big|_{r=t}$$

!?! Markov aannname !?!

$$Q(x, y \mid t, X_{s_1} = z_1, \dots, X_{s_n} = z_n) = Q(x, y)$$

tempomatrix Q



Markoviaans sprongproces



prestatiematen

Wat als we de tempomatrix Q niet exact kennen?

We beschouwen **grenzen** op de tempo's en kijken naar de
verzameling van sprongprocessen

waarvoor

$$\underline{Q}(x, y) \leq Q(x, y \mid t, X_{s_1} = z_1, \dots, X_{s_n} = z_n) \leq \overline{Q}(x, y).$$

We beschouwen grenzen op de tempo's en kijken naar de
verzameling van sprongprocessen

waarvoor

$$\underline{Q}(x, y) \leq Q(x, y \mid t, X_{s_1} = z_1, \dots, X_{s_n} = z_n) \leq \overline{Q}(x, y).$$



Wat met de prestatiematen?



tempomatrix Q



Markoviaans sprongproces



prestatiematen

grenzen $\underline{Q}$ en $\bar{Q}$

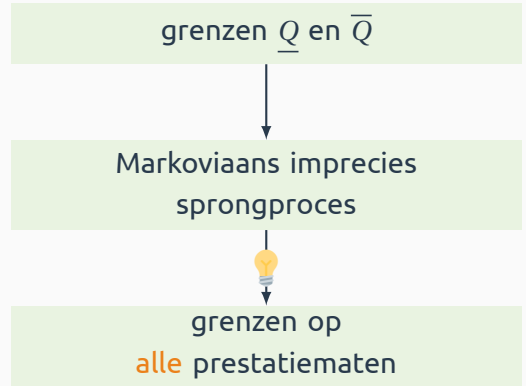
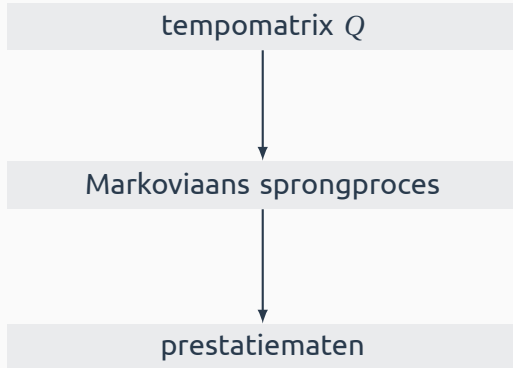


Markoviaans imprecies
sprongproces



grenzen op
'sommige' prestatiematen

Grondslagen, algoritmen ...



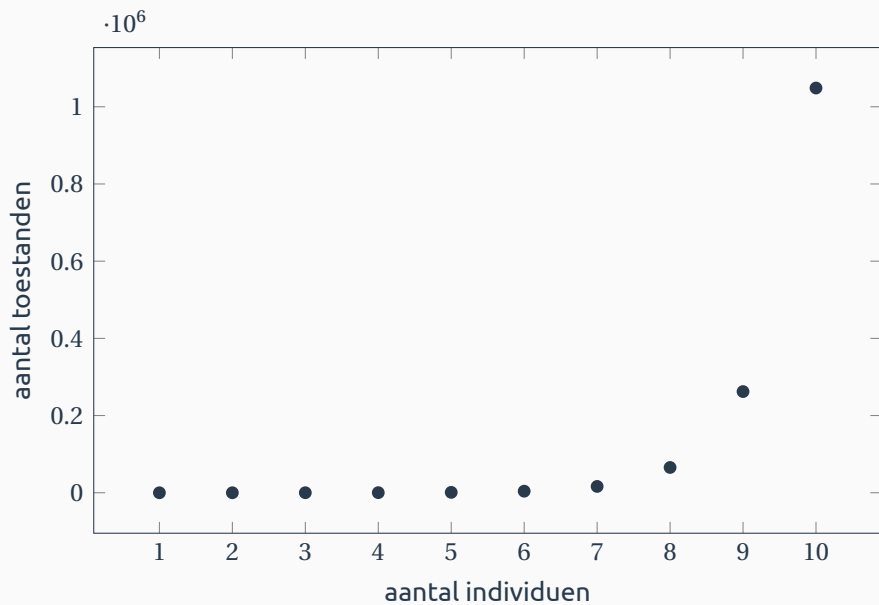
... en toepassingen

gedetailleerde beschrijving

$x = (\text{👮} = \text{😊}, \text{👷} = \text{😓}, \dots)$

tempomatrix Q

prestatie maten



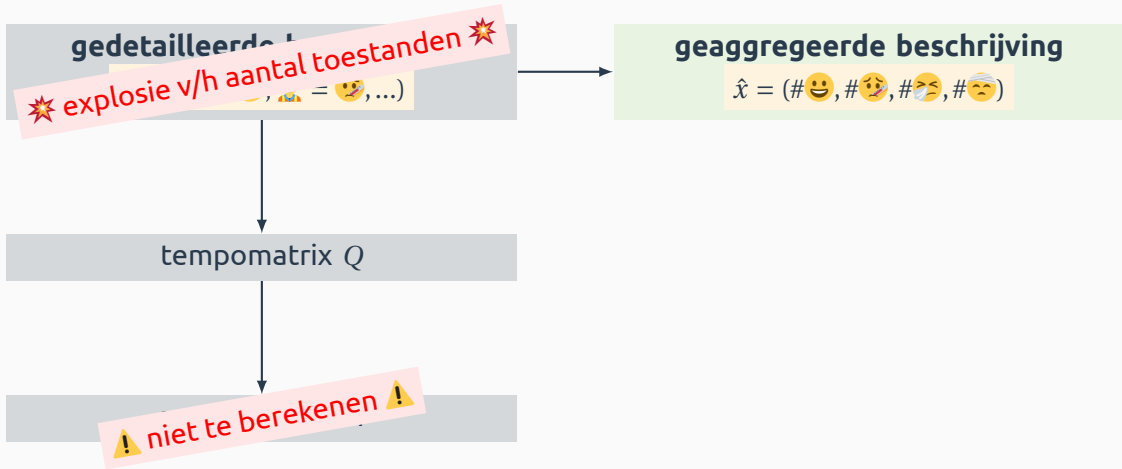
gedetailleerde

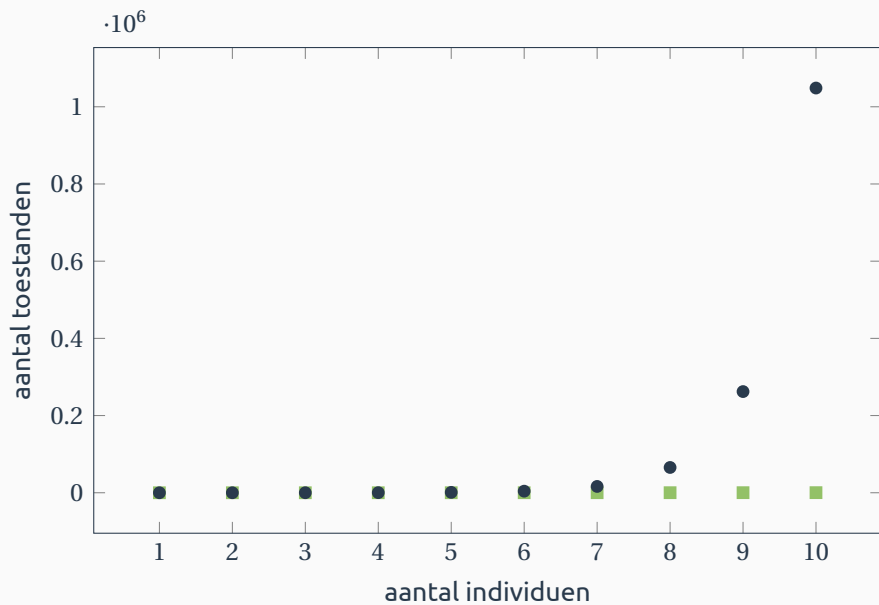
⚡ explosie v/h aantal toestanden ⚡

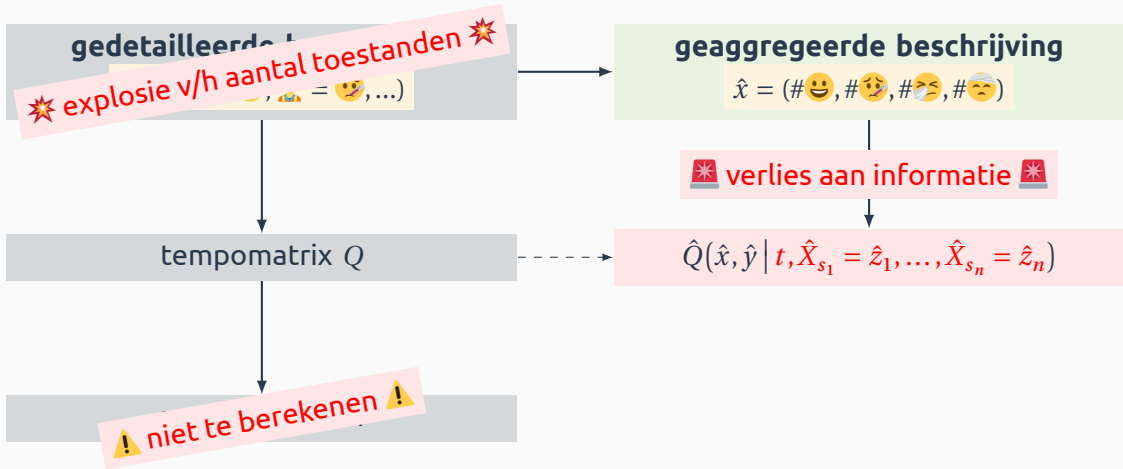
, ...)

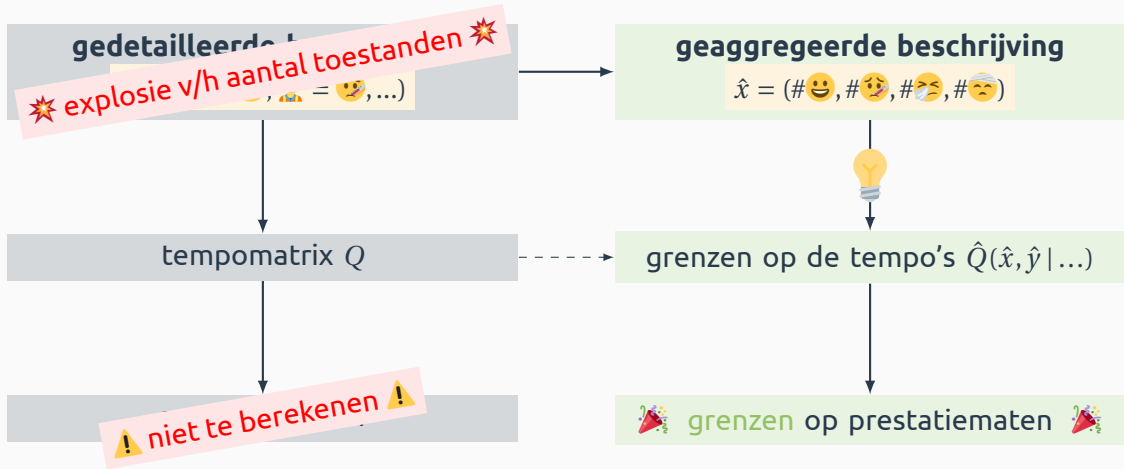
tempomatrix Q

⚠ niet te berekenen ⚠

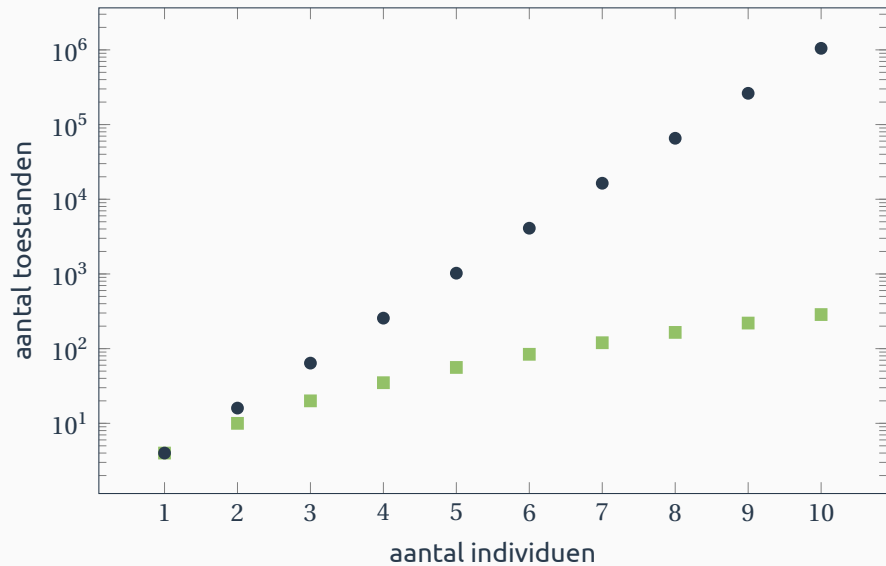




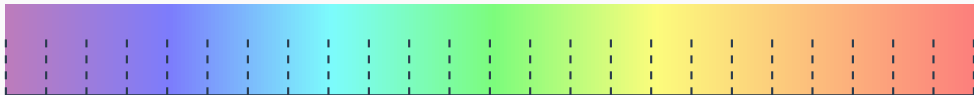




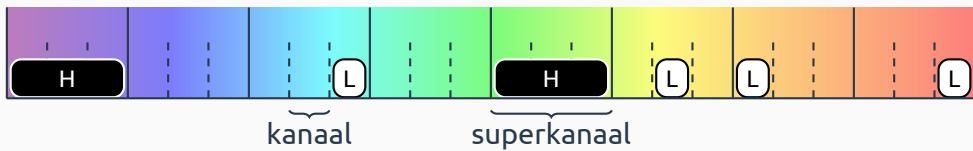




L



H



gedetailleerde beschrijving

$$x = (e, \ell_1, \dots, \ell_k, \dots, \ell_n, h)$$

geaggregeerde beschrijving

$$\hat{x} = (e, \ell, h)$$

aantal lege superkanalen

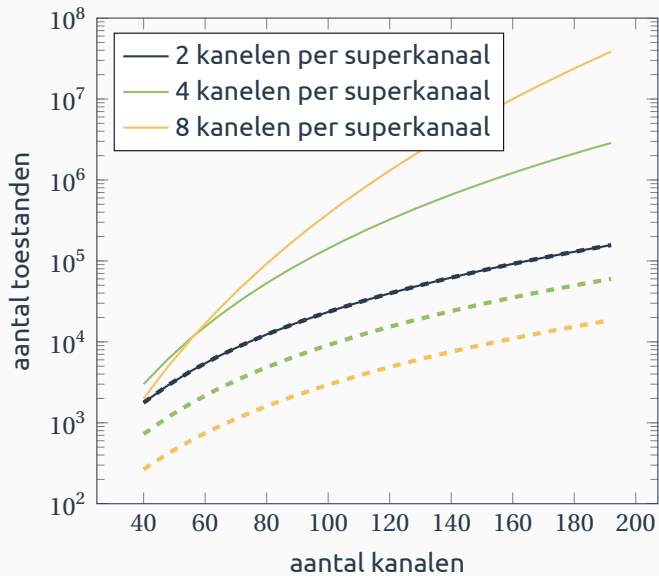
aantal **L**

aantal **H**

aantal **H**

aantal superkanalen met k **L**

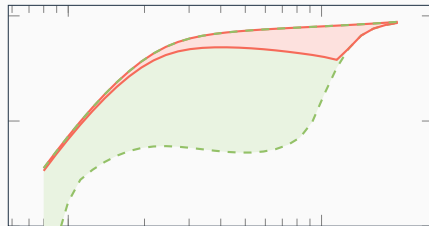
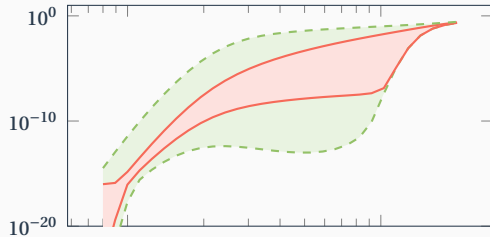
aantal lege superkanalen



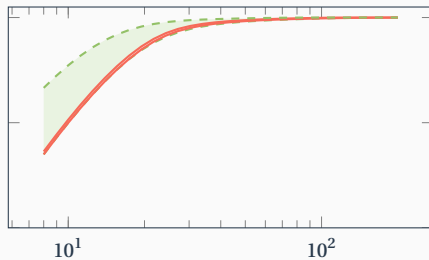
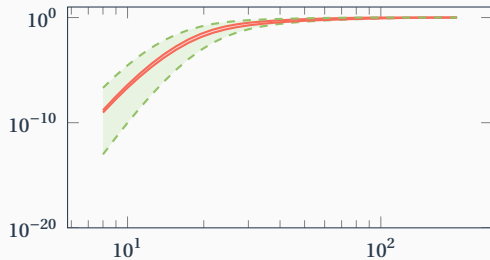
willekeurig kanaal toewijzen

toewijzen aan minst/meest gevuld superkanaal

L



H



belasting

belasting