

# De verkenning van de potentie van fietsparkeren bij het ov

Een casus in Den Haag

22-11-2024

Madeline Lai

51<sup>e</sup> CVS-congres

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 TU Delft



# Wie ben ik?

- Bachelor Civiele Techniek
- Master Civiele Techniek
  - *Traffic and Transport Engineering (TTE)*
  - *Public transport and railway systems specialisme*
- Afstudeeronderzoek
  - Samenwerking met Gemeente Den Haag



# Inhoudsopgave

- Introductie
- Onderzoeksvraag
- Methode
- Resultaten
- Interpretatie
- Conclusie
- Aanbevelingen



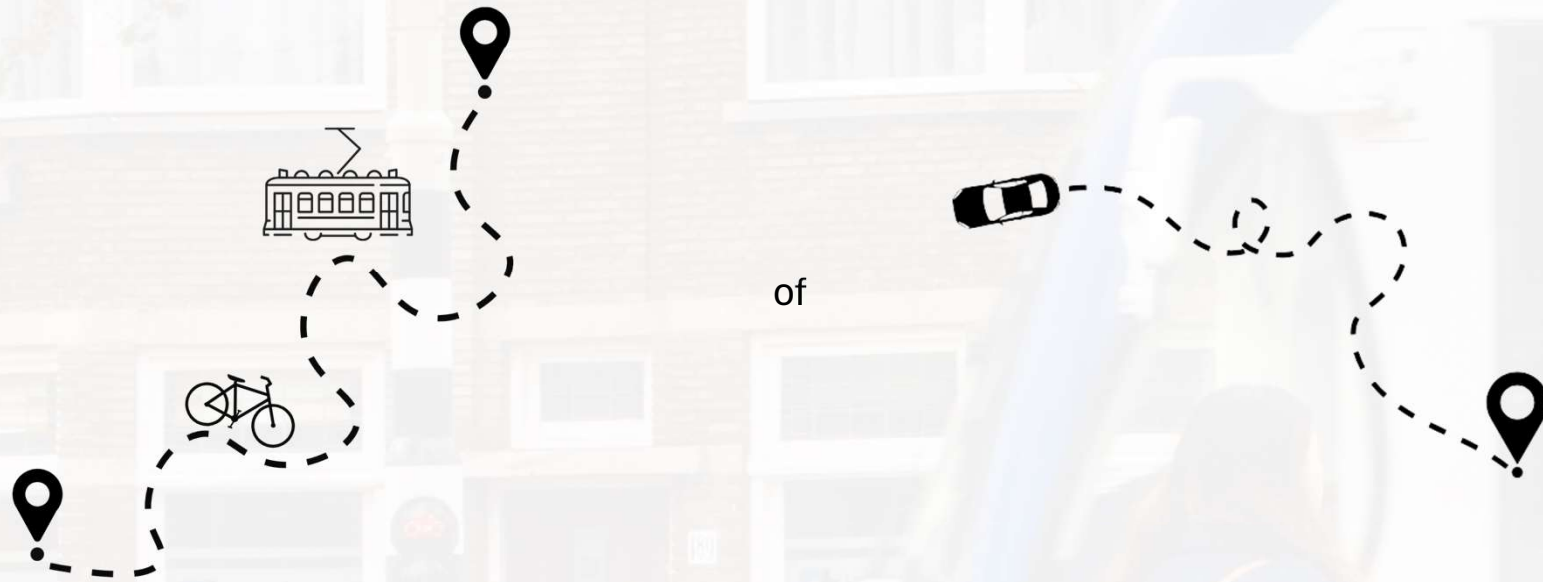
# Introductie

- Korte afstandsritten
- Congestie , milieu- en veiligheidskwesties
- Potentie modal shift
- Focus op fietsparkeren



(Google Maps, 2024)

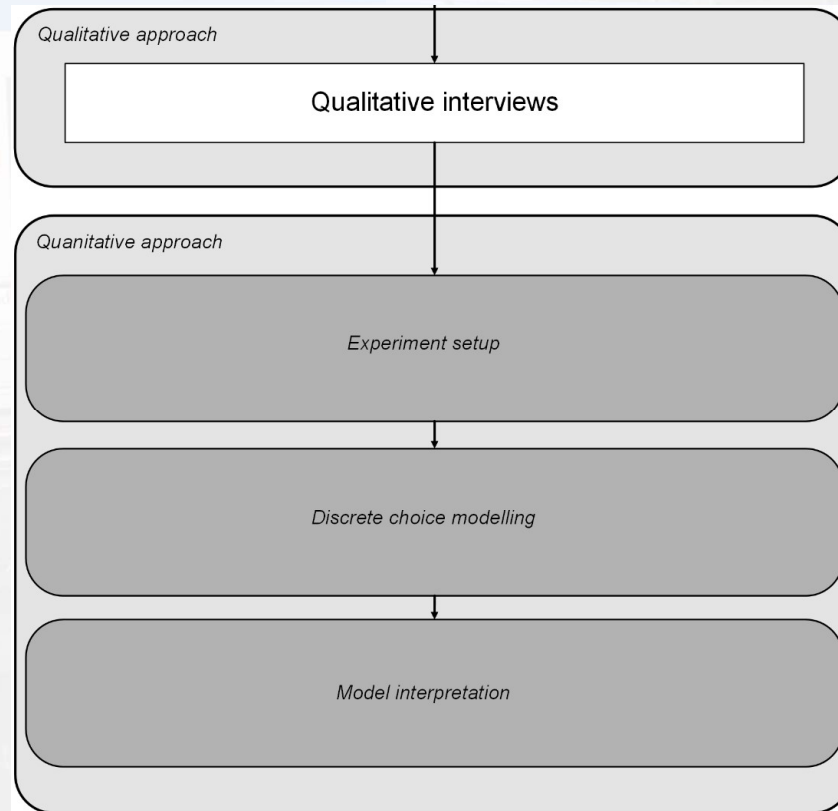
# Intermezzo



## Onderzoeksvraag

*Hoe kunnen fietsparkeergelegenheden bij haltes van het openbaar vervoer worden geïmplementeerd om de multimodale reis van fiets en ov te stimuleren en korte autoritten te ontmoedigen?*

# Methode




# Methode

- Kwantitatief onderzoek:
  - Enquête
  - MNL-model
  - Model interpretatie

## Fiets parkeer faciliteiten

Fiets nietje 



Overdekt parkeren 



Fietskluis 



Geen 

































Fietspomp 





# Methode (Stated preference)

- 8/12 choice tasks
- Alternatieven: - Fiets
  - Fiets + OV
  - Auto
  - Scooter
  - E-bike

Bicycle	Bicycle + PT 1	Bicycle + PT 2	Bicycle	Moped	Car
<b>Bicycle parking facility</b>  Bicycle bracket	<b>Bicycle parking facility</b>  Bicycle bracket	<b>Bicycle parking facility</b>  None	<b>Bicycle parking facility</b>  Bicycle bracket	<b>Bicycle parking facility</b>  Bicycle bracket	<b>Bicycle parking facility</b>  -
<b>Tire pump</b>  No	<b>Tire pump</b>  Yes	<b>Tire pump</b>  No	<b>Tire pump</b>  No	<b>Tire pump</b>  -	<b>Tire pump</b>  -
<b>Parking time</b>  1 min	<b>Parking time</b>  1 min	<b>Parking time</b>  1 min	<b>Parking time</b>  1 min	<b>Parking time</b>  1 min	<b>Parking time</b>  2 min
<b>Travel time on bicycle</b>  12 min	<b>Travel time on bicycle and transit</b>  12 min	<b>Travel time on bicycle and transit</b>  6 min	<b>Travel time on bicycle</b>  12 min	<b>Travel time on moped</b>  4 min	<b>Travel time in car</b>  12 min
<b>Travel costs</b>  € 0	<b>Travel costs</b>  € 4	<b>Travel costs</b>  € 2	<b>Travel costs</b>  € 0	<b>Travel costs</b>  € 6	<b>Travel costs</b>  € 4

# Resultaten (Kwalitatief)

- Openheid fiets – ov combinatie
- Barrières: gebrek aan veilige/toegankelijke parkeerplekken
- Persoonlijke beperkingen

*“Ik kan niet zo goed fietsen en ik ben niet comfortabel.”*



(Google Maps, 2024)

# MNL-model resultaten

Baseline traveller				
Parameter	Estimated value	Rob. Std err	Rob. t-test	Rob. p-value
ASC bicycle	1.75	0.23	9.59	0
ASC car	-0.34	0.26	-5.86	<0.001
ASC e-bike	2.39	0.32	11.50	0
ASC moped	-2.17	0.62	-3.48	<0.001
Bicycle pump	-0.44	0.14	-3.08	0.002
Bicycle parking bracket	0.34	0.18	1.94	0.053
Bicycle parking safes	0.66	0.17	3.85	<0.001
Shedded bicycle parking	-0.38	0.30	-1.28	0.202
Travel costs	-0.18	0.05	3.94	<0.001
Travel time	-0.15	0.01	-11.3	0

# MNL-model resultaten

Estimated parameters

	Value	Rob. Std err	Rob. t-test	Rob. p-value
ASC_bike	1.75	0.225	9.59	0
ASC_car	-0.34	0.263	-5.86	4.71e-09
ASC_ebike	2.39	0.321	11.5	0
ASC_moped	-2.17	0.624	-3.48	0.000506
beta_bicycle_pump	-0.442	0.143	-3.08	0.00206
beta_bike_age35_44	0.826	0.164	5.04	4.61e-07
beta_education_high_ebike	-1.13	0.255	-4.44	8.87e-06
beta_education_middle_car	0.986	0.205	4.81	1.51e-06
beta_factor1_bike_PT	0.289	0.0852	3.4	0.000686
beta_factor2_car	0.365	0.116	3.14	0.00171
beta_income_middle_bike	0.433	0.109	3.99	6.7e-05
beta_moped_age35_44	-0.165	0.0135	-12.2	0
beta_moped_age45_54	2.05	0.743	2.76	0.00574
beta_parking_bracket	0.34	0.175	1.94	0.0526
beta_parking_facility_shedded_age45_54	0.844	0.412	2.05	0.0404
beta_parking_facility_shedded_education_middle	1.32	0.389	3.39	0.000711
beta_parking_facility_shedded_income_high	-4.18	0.598	-6.99	2.67e-12
beta_parking_safes	0.663	0.172	3.85	0.000119
beta_parking_shedded	-0.382	0.299	-1.28	0.202
beta_travel_costs	-0.179	0.0455	3.94	8.23e-05
beta_travel_costs_age18_24_bike_PT	-0.235	0.0706	-3.32	0.000888
beta_travel_costs_age35_44_moped	-0.91	0.138	-6.62	3.59e-11
beta_travel_costs_age55_64	-0.109	0.0481	-2.26	0.0235
beta_travel_costs_income_high	-0.215	0.0978	-2.2	0.0279
beta_travel_time	-0.147	0.0133	-11.1	0
beta_travel_time_age35_44_moped	-0.816	0.088	-9.27	0
beta_travel_time_age45_54	0.0717	0.0176	4.08	4.47e-05
beta_travel_time_age55_64	0.0789	0.0232	3.4	0.000674
beta_travel_time_age65_74	0.0873	0.0233	3.75	0.000178
beta_travel_time_age75_bike	0.086	0.0179	4.8	1.62e-06
beta_travel_time_age75_bike_PT	0.139	0.0247	5.65	1.64e-08
beta_travel_time_education_high_moped	-0.238	0.0662	3.59	0.000326
beta_travel_time_man_bike_PT	-0.0859	0.0211	-4.08	4.59e-05
beta_travel_time_woman_bike_PT	-0.123	0.0227	-5.42	6.11e-08





# Interpretatie

- Personas, reizen and scenario's

From Fultonstraat 11-171 to De Savornin Lohmanplein 1		
Mode	Travel time	Travel costs
Bicycle	10 minutes	€0
Bicycle + PT	10 minutes	€1.50
Car	9 minutes	€2
Moped	9 minutes	€2
E-bike	9 minutes	€0

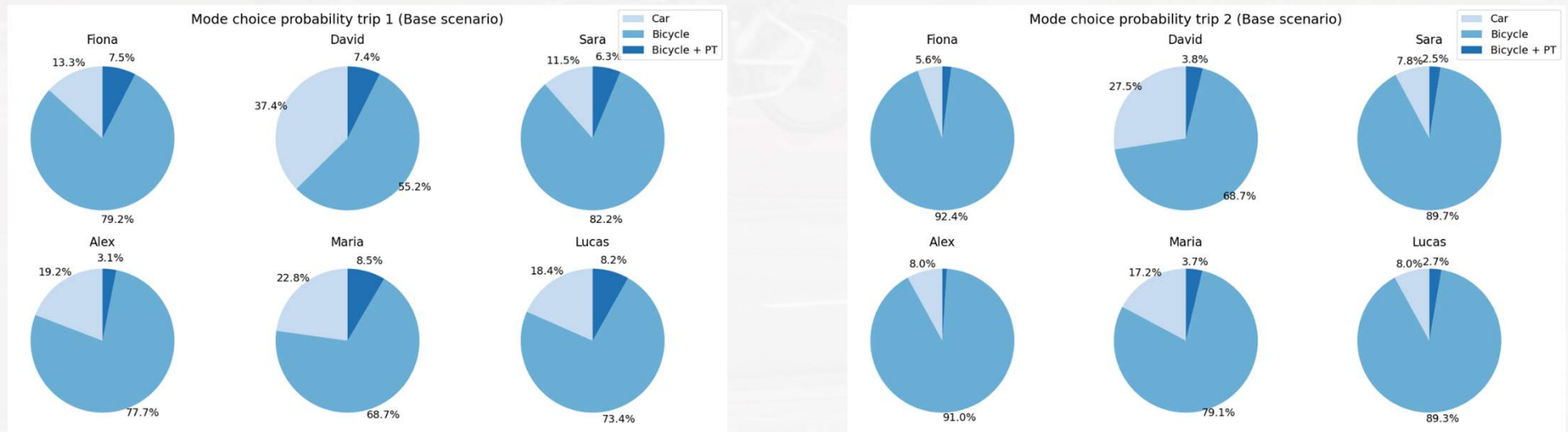
From Repelaerstraat 1-84 to Laan van Meerdervoort 50B		
Mode	Travel time	Travel costs
Bicycle	9 minutes	€0
Bicycle + PT	15 minutes	€1.50
Car	15 minutes	€2
Moped	10 minutes	€2
E-bike	8 minutes	€0



Scenario	Modication(s)		
Base scenario	-	-	-
Scenario 1	Add brackets	-	-
Scenario 2	Add brackets	Add shedded parking	-
Scenario 3	Add brackets	Add bicycle safes	-
Scenario 4	Add brackets	Add shedded parking	Add bicycle safes
Scenario 5	Increase car costs by €2	-	-
Scenario 6	Increase car costs by €2	Add brackets	-
Scenario 7	Increase car costs by €2	Decrease PT costs by €0.50	Add brackets

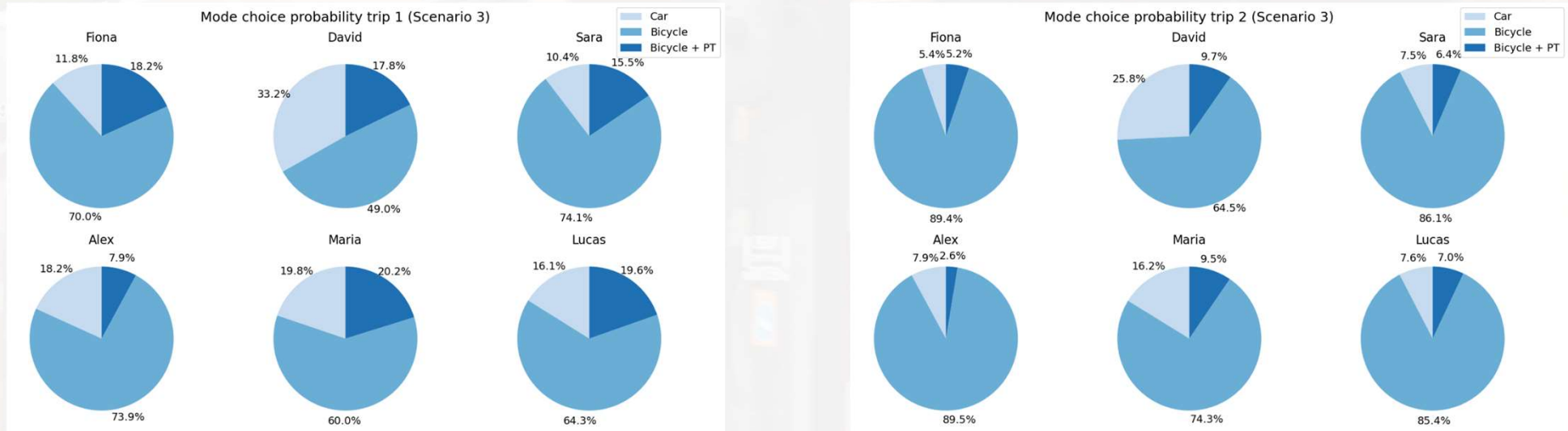
# Interpretatie

## Basis scenario



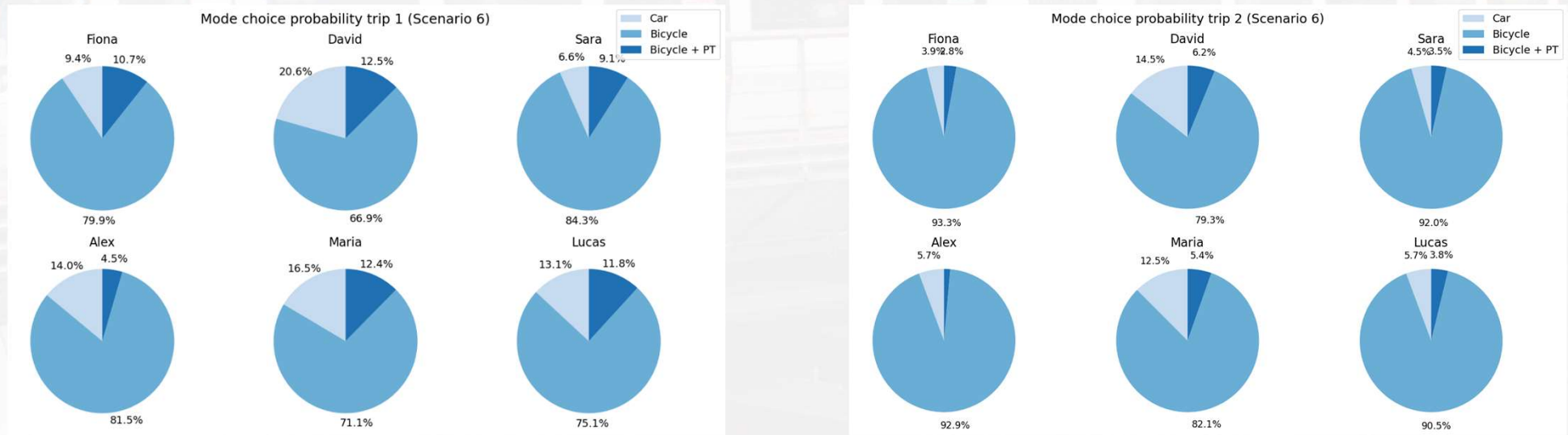
# Interpretatie

## Scenario 3 met fietsnietjes en fietskluizen



# Interpretatie

## Scenario 6 met €2 extra auto reiskosten en fietsnietjes





# Interpretatie

## Verwachting modal shift

- Fietsparkeren
  - Fiets + ov 2 %pt ↑
  - Autogebruik 3%pt ↓
- Fietsparkeren + prijsverandering
  - Fiets + ov 5%pt ↑
  - Autogebruik 6.5%pt ↓



# Interpretatie

## The Hague

567,000 residents      2.5 trips per day      =      1,417,500 trips



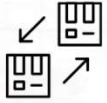
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=




1,417,500 trips      32 %      =      453,600 trips by car




×




=




453,600 trips by car      18% under 2.5km      =      81,648 trips < 2.5km




×




=




453,600 trips by car      19% between 2.5 - 5.0 km      =      86,184 trips of 2.5 to 5.0 km



×



=



# Interpretatie

## Short-distance car trips under 2.5 kilometre

81,648 trips

3%

2450 cancelled car trips



81,648 trips

2%

1633 new bicycle + PT trips



## Short-distance car trips between 2.5 and 5 kilometre

86,184 trips

1%

862 cancelled car trips



86,184 trips

4%

3447 new bicycle + PT trips



# Conclusie

*Hoe kunnen fietsparkeergelegenheden bij haltes van het openbaar vervoer worden geïmplementeerd om de multimodale reis van fiets en ov te stimuleren en korte autoritten te ontmoedigen?*

- Fietsnietjes en kluizen ✓
- Versterken met kosten €
- Veilig en goed onderhouden ✂



# Aanbevelingen

- Implementatie van fietsparkeren
  - Focus op fietsnietjes
  - Verdere onderzoek naar locaties/type faciliteiten
- Verkenning kostenverandering €
  - Auto ↑
  - Fiets + ov ↓
- Promotie 
  - Nieuwe faciliteiten
  - Stimulatie fietsgebruik





TU Delft



Den Haag

Q&A