

# Algorithmic decision-making in Employment

And its relation with Gig Economy

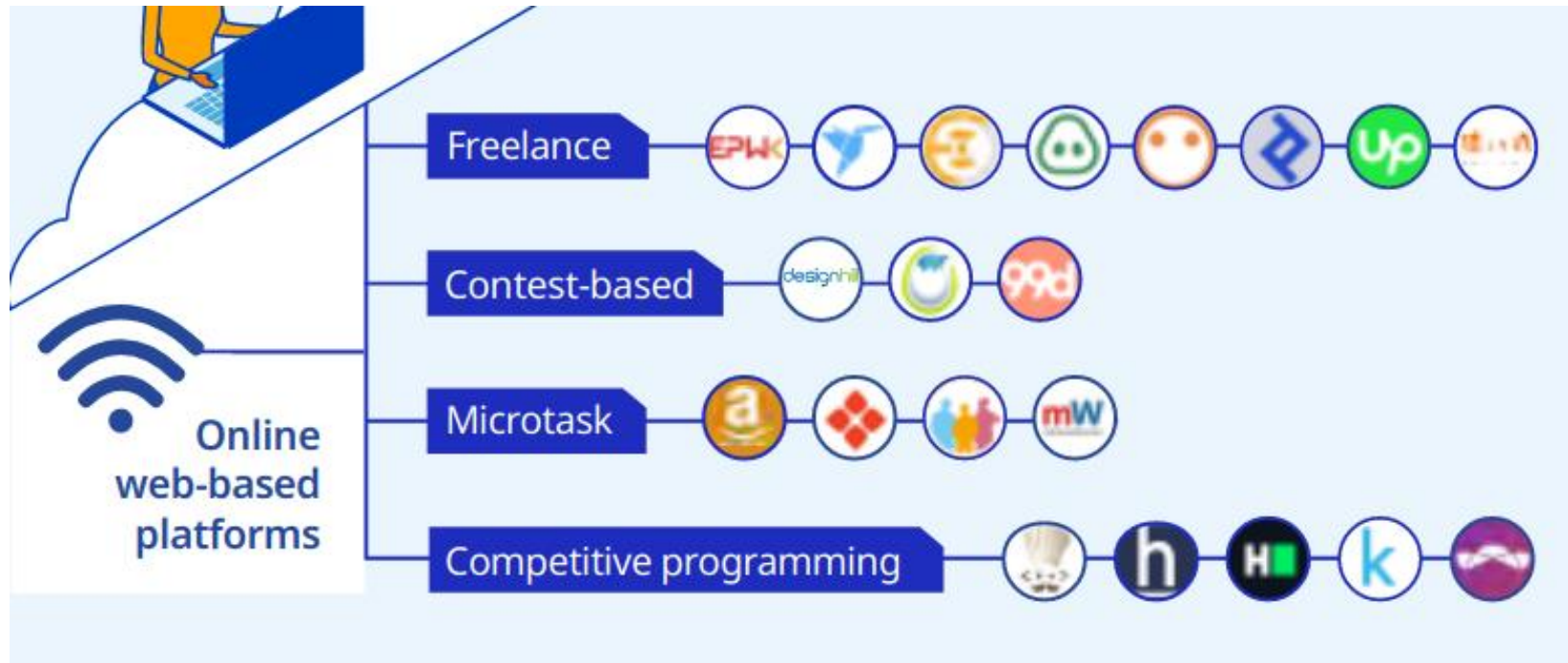
Chaewon Yun & Eduardo Perez

# Brief introduction / Key concepts

- Algorithmic decision making (ADM) in employment has seen incremental growth across all business processes. (Bughin et al, 2018)
- Main drivers for ADM in employment: cutting costs, up scaling, competitor advantage.
- Nudging: draw on behavioural science principles to trigger automatic cognitive processes in favour of desired choices. (Tan et al, 2021)

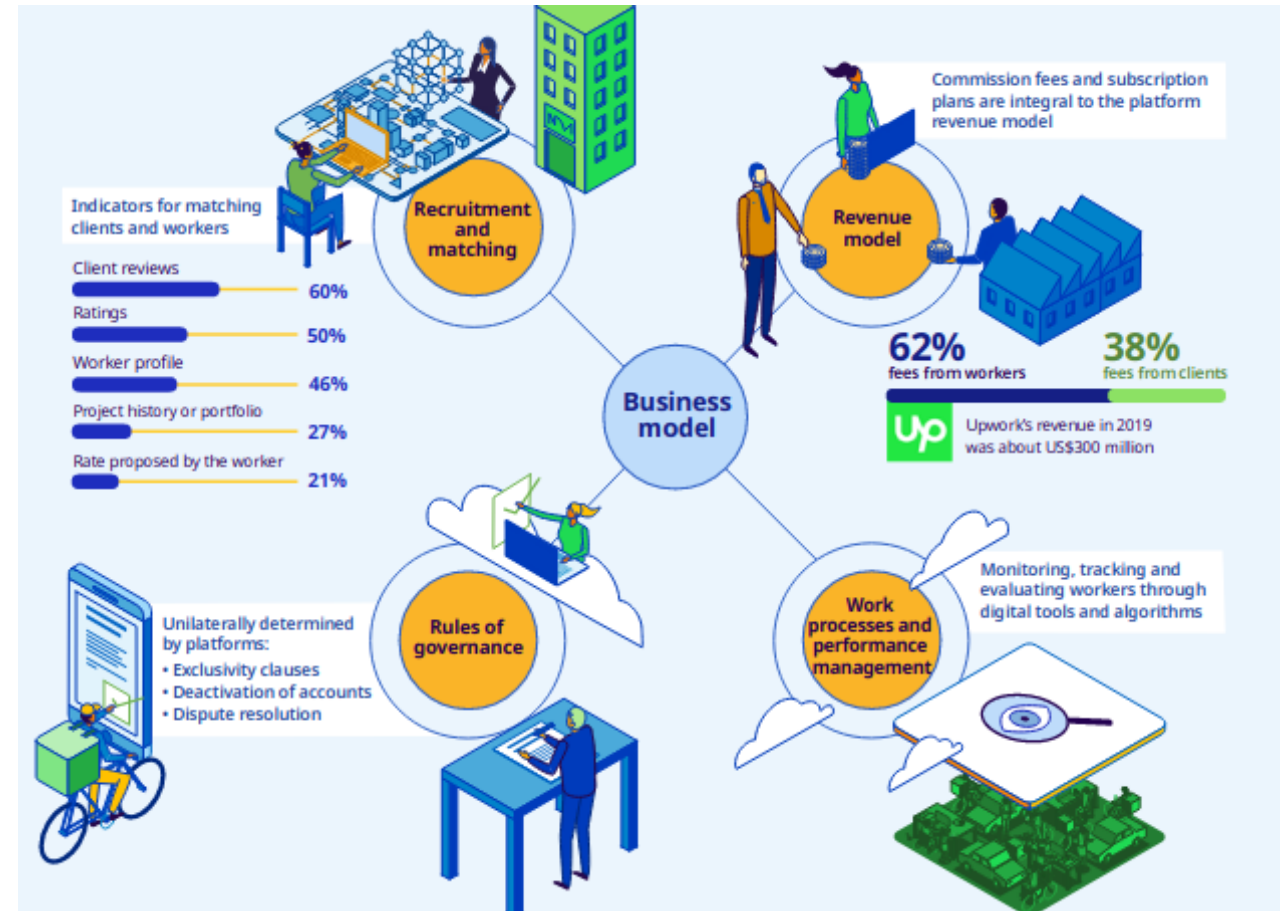
# Gig economy

- The 'gig economy' refers to markets in short-term, on-demand, occasional, and typically task-based labour. (Tan et al, 2021)



# Motivation

- Gig workers are between 20 to 30% of the working population in Europe.
- ADM is ever more present in gig digital platforms.



(Rani et al, 2021)

Empirical Studies

# Applicant perceptions of hiring algorithms –Uniqueness and discrimination experiences as moderators (Kaibel et al, 2019)

- Study on how applicants perceive the use of algorithms in the hiring process.
- Applicant Attribution-Reaction Theory
- Hypothesize individuals may favor human decision-makers when they have a non-standard professional biography
- Hypothesize that individuals with discrimination experiences favor algorithms over human decision-makers
- Results:
  - Participants perceived the selection process as significantly more consistent when an algorithm, as opposed to a company representative, was used to screen their application
  - General attractiveness varied under the algorithm-based decision:
    - Lower (uniqueness)
    - Higher (discrimination)

# Microtargeting control: Explicating algorithmic control and nudges in platform-mediated cab driving in India. (Tan et al, 2021)

- Compare algorithmic control with direct control based on archival data of app-based cab companies in India
- Algorithmic control is advanced form of direct and indirect control in scale and scope
- Nudge is an integral part of algorithmic control
- Findings
  - Algorithmic control: Centralized automated system
  - Driver profiling and segmentation: Extensive profiling with beyond work-related information such as religion
  - Managing driver earnings: Personalized incentive schemes for individual drivers
  - Nudge: Present existing goals differently without change in economic incentives
    - e.g. Goal-gradient effect (*'You are one trip away from 45 trips'*)

# Research Design



# Research Design

- Hypothesis:
  - Food delivery drivers will be more satisfied with their work when transparent matching direction is coming from human
- Experimental two-factor design
  - IV1: Decision-making agent (Algorithm - Human)
  - IV2: Matching mechanism's transparency (Transparent - Opaque)
  - DV: Driver's satisfaction for work
- Between-subject design
  - Participants: 200 Lieferando drivers in Aachen (Convenience sampling)
  - Participants are randomly divided into four groups (50 participants X 4 groups)
    - 1 control group, 3 treatment groups
- Participants are working with manipulation condition for a week.
  - Before and after the week of experiment, they answer the questionnaire.

# Research design structure

Subject of matching / Matching mechanism	Algorithm	Human
<b>Opaque</b>	<b>Control Group</b> <ul style="list-style-type: none"><li>• Drivers receive directions by an algorithm</li><li>• Algorithm gives no explanation for each matching</li></ul>	<b>Treatment Group 1</b> <ul style="list-style-type: none"><li>• Drivers receive directions by a human</li><li>• Human gives no explanation for each matching</li></ul>
<b>Transparent</b>	<b>Treatment Group 2</b> <ul style="list-style-type: none"><li>• Drivers receive directions by an algorithm</li><li>• Algorithm provides explanation of factors affected the decision</li></ul>	<b>Treatment Group 3</b> <ul style="list-style-type: none"><li>• Drivers receive directions by a human</li><li>• Human provides explanation of factors affected the decision</li></ul>

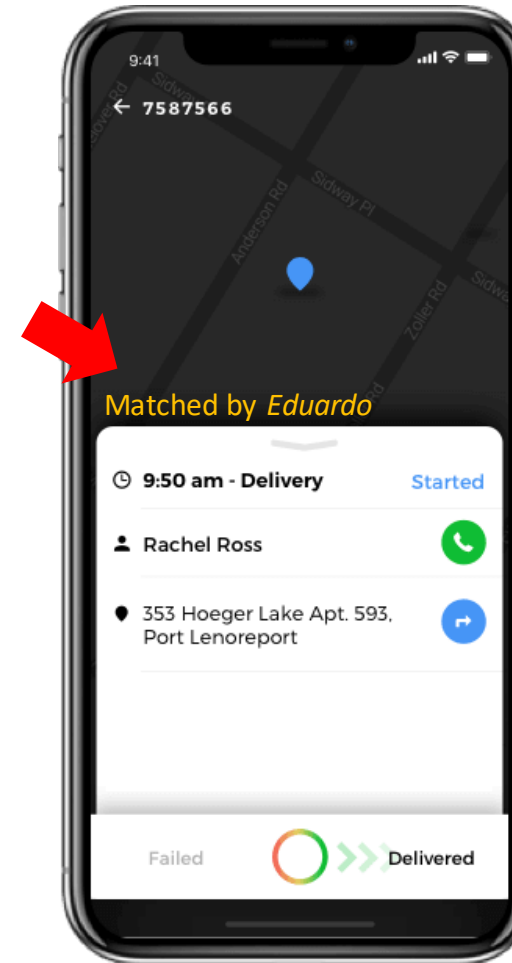
# Operationalization

## Independent Variable

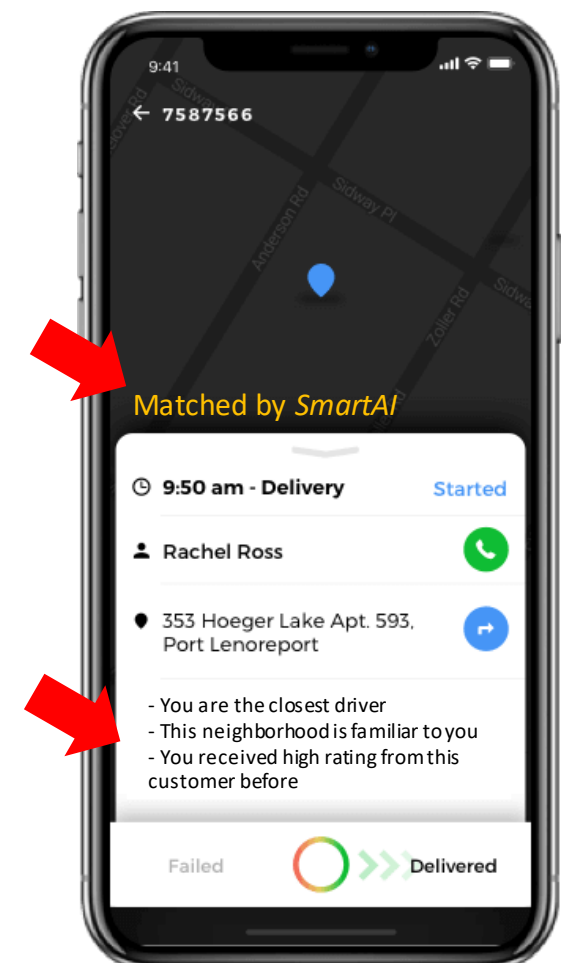
- IV1: Participants are notified who will be giving directions before the experiment starts and reminded in the app
- IV2: Each group receives directions with or without explanation for the matching in the app

## Dependent Variable

- Drivers answer the questionnaire before and after the experiment week
  - e.g. Satisfaction for work, perceived fairness in treatment, willingness to continue work, happiness etc.



Opaque + human  
example



Transparent + algorithm  
example

# Operationalization

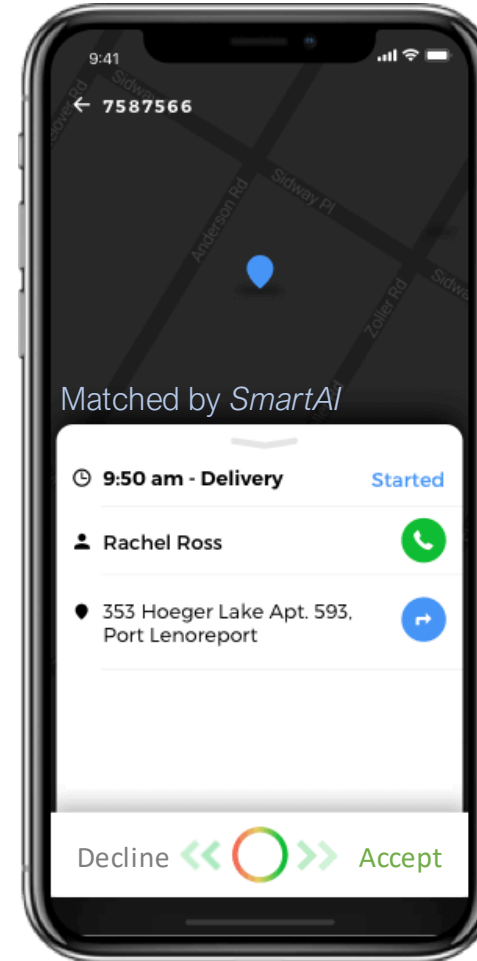
## Independent Variable

- IV1: Participants are notified who will be giving directions before the experiment starts and reminded in the app
- IV2: Each group receives directions with or without explanation for the matching in the app

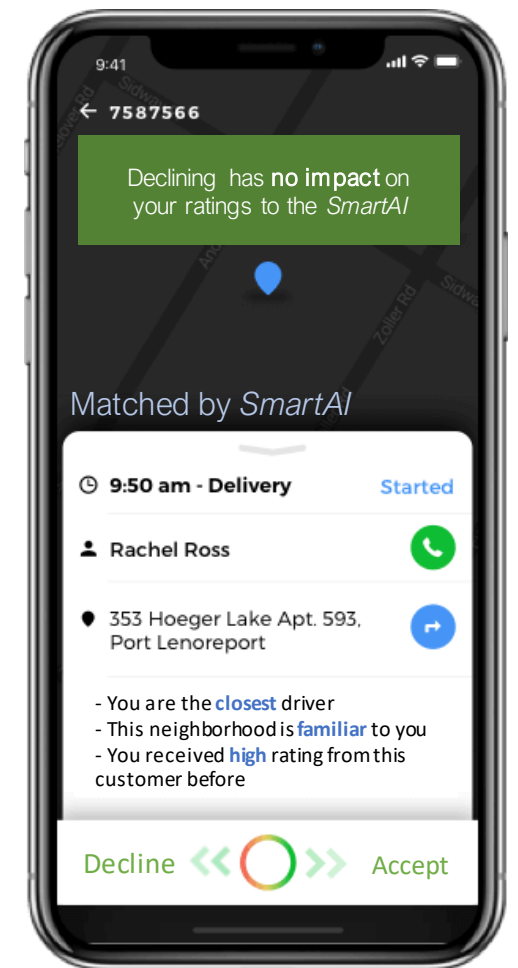
## Dependent Variable

- Drivers answer the questionnaire before and after the experiment week
  - e.g. Satisfaction for work, perceived fairness in treatment, willingness to continue work, happiness etc.

Transparent  
+ Lower /  
example  
Opaque  
+ higher Autonomy  
example



<Fig 1>  
Opaque, Low autonomy condition



<Fig 2>  
Transparent, High autonomy condition

# Advantages and Limitations

## **Advantages**

- Examine more specific element (transparency) of algorithmic decision that affects the driver's perception
- Findings can provide insights to other algorithmic controls (ex. Car-sharing, recommender system, etc.)

## **Limitations**

- Self-report has a limitation on its validity
- Time related extraneous variables can be found during the experiment

# Ethical Questions

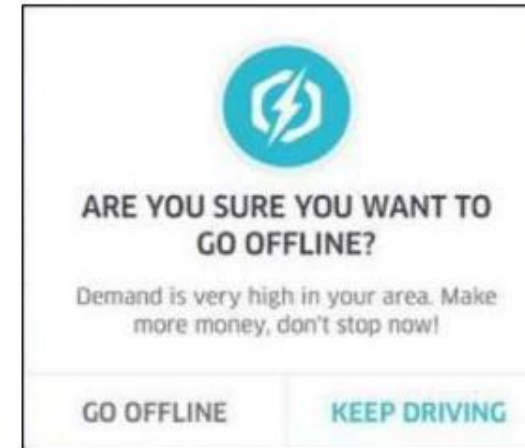
# Ethical debate in Gig Economy (Tan et al.)



- New Organization of Work
  - Reputation scores facilitates a 'system of control'. [Justice]
  - Platform administrators without obligation to inform workers about the algorithm. [Fairness]
  - Ratings exert implicit control and monitoring throughout the working process. [Privacy]

# Taking it further: Algorithmic "Pressure"

- Nudging algorithms:
  - Gig workers receive notifications when off-work about "potential losses".
  - Gig drivers are nudged to continue driving when they attempt to log off: 'Demand is high, are you sure you want to log off?'
- Adjusting behavior to be favored by algorithm
  - Freelancers trying to "crack" the algorithmic for more exposure in the platform (Shevchuk et al, 2021)



Tan et al (2021)



# More Ethical Concerns on ADM systems

- But if we start to adjust our working ethic to be positively rated by an algorithm, could we find meaning in our job?
- Or are there tasks where ADM should not be employed by corporations?



# References

- Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2018). Notes from the AI frontier: Modeling the impact of AI on the world economy. *McKinsey Global Institute*.
- Kaibel, C., Koch-Bayram, I., Biemann, T., & Mühlenbock, M. (2019, July). Applicant perceptions of hiring algorithms-uniqueness and discrimination experiences as moderators. In *Academy of Management Proceedings* (Vol. 2019, No. 1, p. 18172). Briarcliff Manor, NY 10510: Academy of Management.
- Kim, Tae Wan & Scheller-wolf, Alan. (2019). Technological Unemployment, Meaning in Life, Purpose of Business, and the Future of Stakeholders. *Journal of Business Ethics*. Forthcoming. 10.1007/s10551-019-04205-9.
- Rani, U., Kumar Dhir, R., Furrer, M., Göbel, N., Moraiti, A., & Cooney, S. (2021). World Employment and Social Outlook: The Role of Digital Labour Platforms in Transforming the World of Work.
- Rebecca, J. (May 25, 2021). The influencers are burned out, too, *Vox*, <https://www.vox.com/the-goods/2021/5/25/22451987/influencer-burnout-tiktok-clubhouse>
- Shalini, & Bathini, D. R. (2021). Microtargeting control: Explicating algorithmic control and nudges in platform-mediated cab driving in India. *New Technology, Work and Employment*, 36(1), 74-93.
- Shevchuk, A., Strebkov, D. and Tyulyupo, A. (2021), Always on across time zones: Invisible schedules in the online gig economy. *New Technology, Work and Employment*, 36: 94-113. <https://doi.org/10.1111/ntwe.12191>
- Tan, Z. M., Aggarwal, N., Cows, J., Morley, J., Taddeo, M., & Floridi, L. (2021). The ethical debate about the gig economy: a review and critical analysis. *Technology in Society*, 65, 101594.
- Taylor, L. (June 8, 2021). Young Creators Are Burning Out and Breaking Down, *The New York Times*, <https://www.nytimes.com/2021/06/08/style/creator-burnout-social-media.html?searchResultPosition=6>
- Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy. *Work, Employment and Society*, 33(1), 56–75. <https://doi.org/10.1177/0950017018785616>

# THANK YOU

