

Algorithmic decision-making in Employment

And its relation with Gig Economy

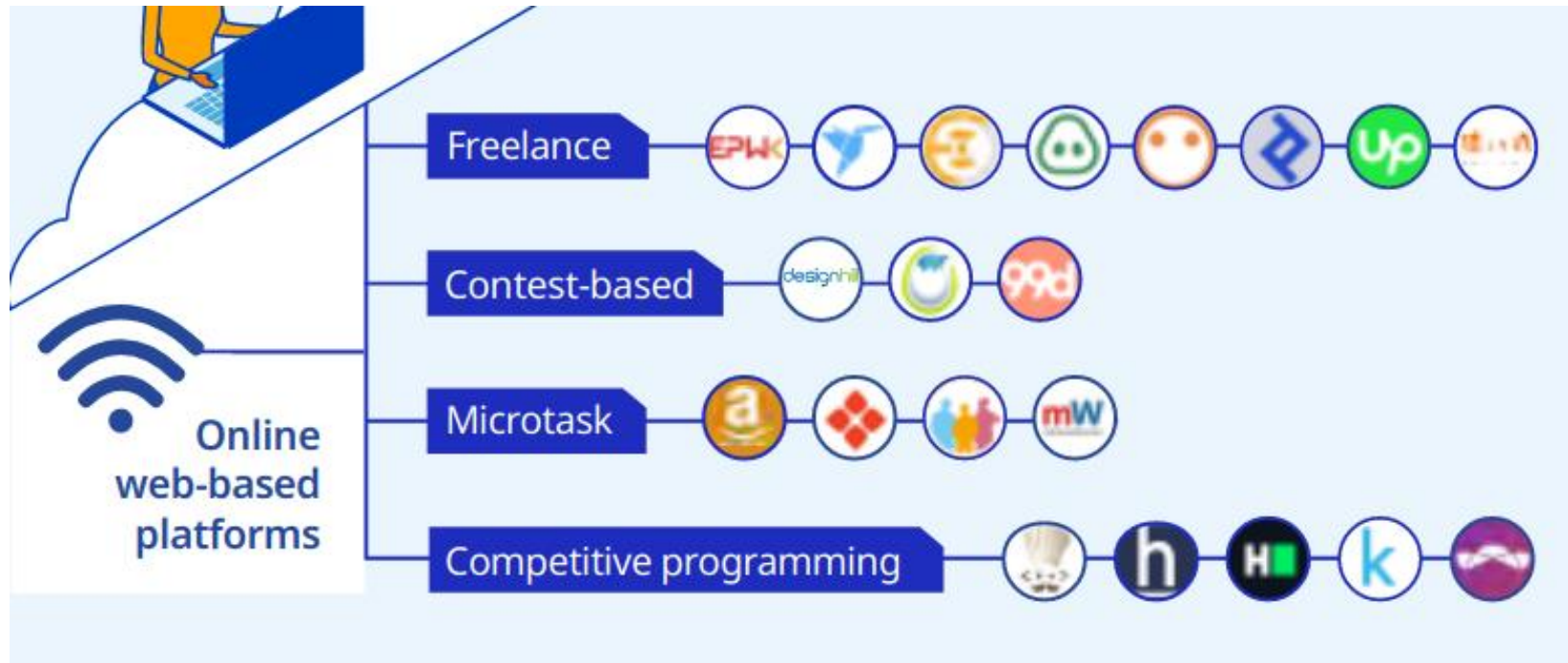
Chaewon Yun & Eduardo Perez

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)

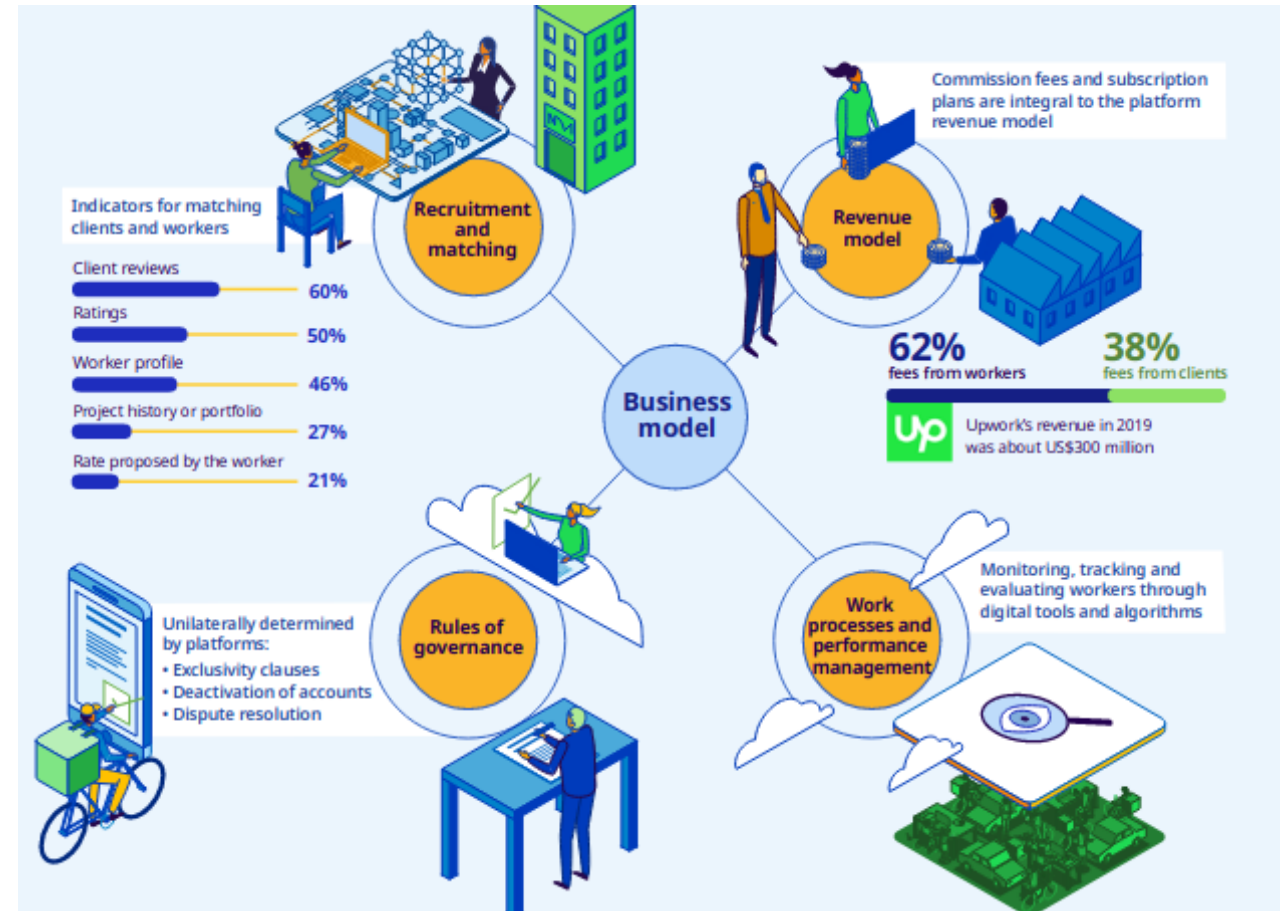
Gig economy

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

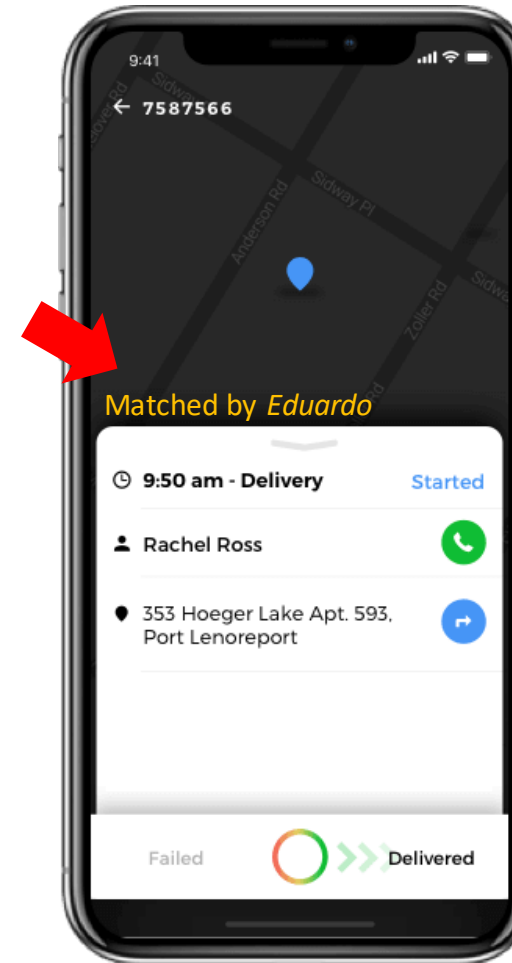
Operationalization

Independent Variable

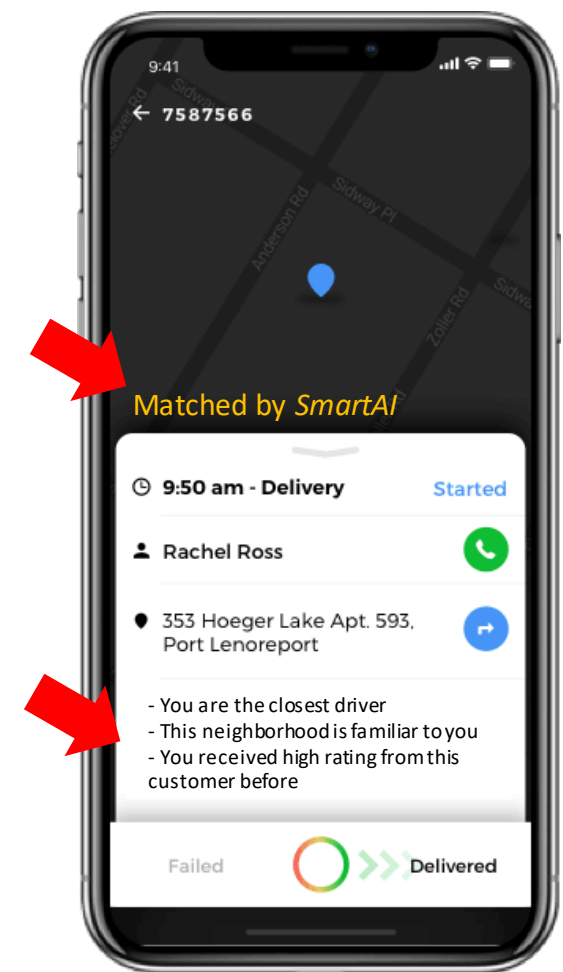
- IV1: Participants are notified who will be giving directions before the experiment starts and reminded in the app
- IV2: Each group receives directions with or without explanation for the matching in the app

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

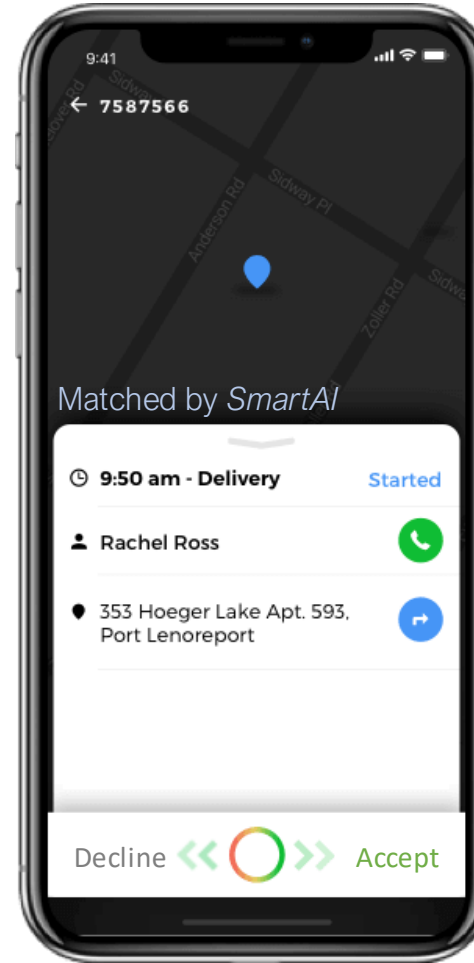
Operationalization

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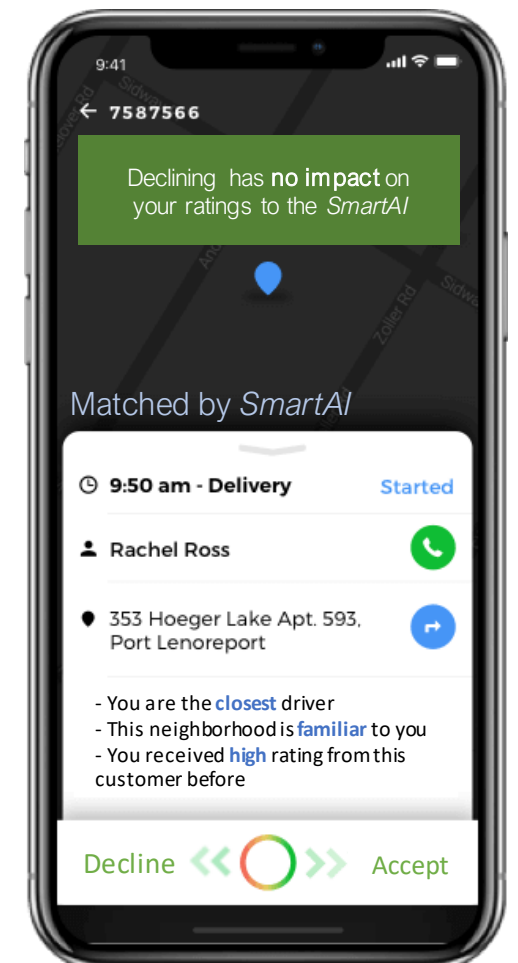
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<Fig 1>
Opaque, Low autonomy condition



<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

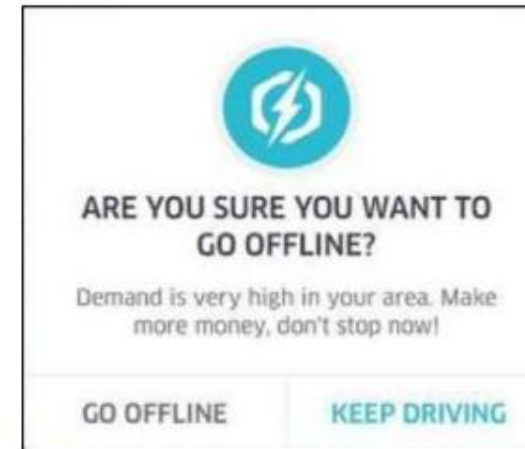
Ethical debate in Gig Economy (Tan et al.)



- 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?



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THANK YOU

