SNU AI POLICY INITIATIVE

Pros and Cons of New Approaches and Alternatives

Remedies for Algorithmic Fairness

『Platform-specific Abusive Conducts and New Digital Theories of Harm』
Sogang University ICT Law & Economy Institute Seminar (Jun. 26, 2023)

Yong Lim
Seoul National University, School of Law

Yong Lim
Associate Professor, Seoul National University
Director, SNU AI Policy Initiative

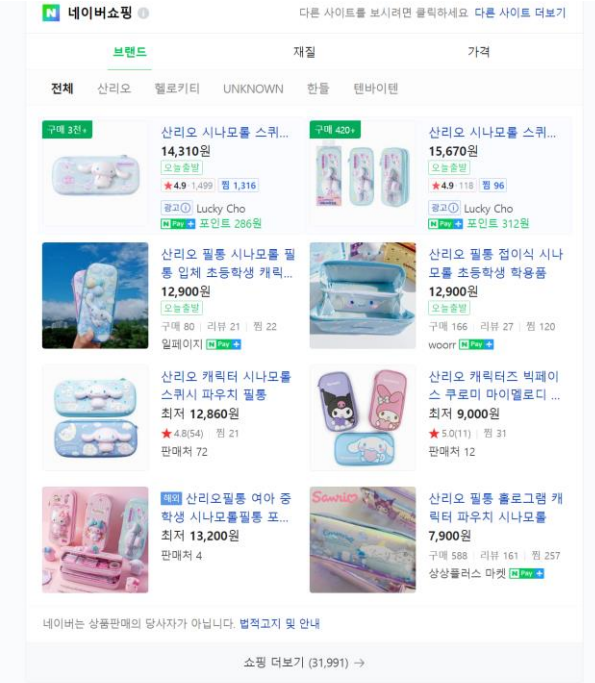
Antitrust Remedies in the Era of Artificial Intelligence

❑ Remedies for antitrust

- Antitrust's "middle child"

❑ Remedies for algorithm-driven conduct

- In the digital era, algorithms will become the subject of antitrust remedies, posing technical, analytical, and administrative challenges to the overall enforcement system
- (Q) What would a proper remedy against *self-preferencing* look like for intelligent systems?



Source: NAVER search results for Cinamoroll pencil case on Jun. 25, 2023

Yong Lim
Associate Professor, Seoul National University
Director, SNU AI Policy Initiative

Antitrust Remedies in the Era of Artificial Intelligence

❑ Regulation of algorithm-driven self-preferencing by platforms

- Legislation
  - EU: DMA Article 6.5

    The gatekeeper shall not treat more favourably, in ranking and related indexing and crawling, services and products offered by the gatekeeper itself than similar services or products of a third party. The gatekeeper shall apply transparent, fair and non-discriminatory conditions to such ranking.

  - Germany: GBW Section 19a

    …

    (2) In the case of a declaratory decision issued pursuant to subsection (1), the Bundeskartellamt may prohibit such undertaking from

    1. favouring its own offers over the offers of its competitors when mediating access to supply and sales markets, in particular

       a) presenting its own offers in a more favourable manner;

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❑ Regulation of algorithm-driven self-preferencing by platforms

- Case enforcement (examples)
  - EU *Google Shopping* (2017)
  - Korea *NAVER Shopping* (2021)
  - EU *Amazon Fulfillment* (2022)
  - Germany *Google News* (2022)
  - Korea *Kakao Mobility* (2023)
    - KFTC finds that Kakao Mobility had manipulated the dispatching algorithm for its taxi-hailing service to favor its own Kakao T Blue franchise taxis over other non-affiliated taxis
    - KFTC orders Kakao Mobility to remove discriminatory elements in the service's dispatch logic and determine the acceptance rate fairly when assigning rides based on the taxi driver's acceptance rate (KFTC, Press release on Feb. 14, 2023)

Source: Economist (Jun 23, 2023), https://economist.co.kr/article/view/ecn202306230009

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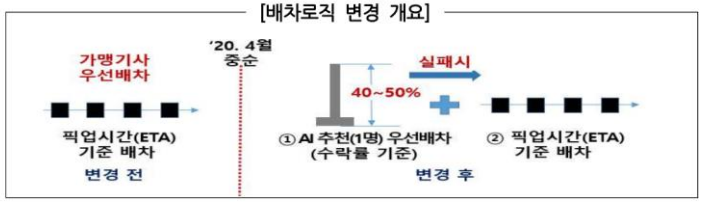
Antitrust Remedies in the Era of Artificial Intelligence

❑ Challenges for antitrust remedies on algorithmic fairness

- Through the lens of the *Kakao Mobility* case
  - Accounting for heterogeneity in AI model and relevant harm
    - Classification AI: discriminative model (Park 2023)
    - Allocative harm
  - Selecting appropriate fairness criteria
    - Limitations of input focused criteria (*e.g.*, fairness through unawareness)
      - Initial dispatch logic: different ETAs for Kakao T Blue taxis
      - Changed dispatch logic: acceptance rate that favors Kakao T Blue taxis → discrimination by proxy



※ 변경된 배차로직에서는 AI 추천(1명) 우선배차가 먼저 실시되고, 추천 기사가 없는 등의 사유로 동 배차가 실패하면 픽업시간(ETA) 기준 배차가 실시됨

Source: KFTC (Feb. 14, 2023)

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Antitrust Remedies in the Era of Artificial Intelligence

❑ Challenges for antitrust remedies on algorithmic fairness

- Through the lens of the *Kakao Mobility* case
  - Selecting appropriate fairness criteria
    - Limitations of output focused criteria
      - Demographic (outcome) parity
        - *Ricci v. DeStefano*, 557 U.S. 557 (2009)
      - Conditional demographic parity
        - Choosing appropriate explanatory factors (*e.g.*, customer rating, acceptance rate)
      - Equalized odds (separation) / Equal opportunity (false negative rate parity)
        - Questions as to conformity with current competition law standards
        - Tension between different protected attributes (*e.g.*, Kakao affiliation v. acceptance rate)
        - Violation of single-threshold principle (Kim 2023 *forthcoming*)
      - Predictive value parity
        - Failure to correct for discrimination generating bias (Barocas, Hardt & Narayanan 2022)

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❑ Challenges for antitrust remedies on algorithmic fairness

- Through the lens of the *Kakao Mobility* case
  - Conducting trade-offs between competing fairness considerations (*e.g.*, merit, opportunity)
    - Algorithmic fairness criterion (*e.g.*, demographic parity, equalized odds, predictive parity)

      $\boldsymbol{P}(\boldsymbol{R} = + \mid \boldsymbol{A} = \boldsymbol{a}) = \boldsymbol{P}(\boldsymbol{R} = + \mid \boldsymbol{A} = \boldsymbol{b}), \forall \boldsymbol{a}, \boldsymbol{b} \in \boldsymbol{A}$

      $\boldsymbol{P}(\boldsymbol{R} = + \mid \boldsymbol{Y} = \boldsymbol{y}, \boldsymbol{A} = \boldsymbol{a}) = \boldsymbol{P}(\boldsymbol{R} = + \mid \boldsymbol{Y} = \boldsymbol{y}, \boldsymbol{A} = \boldsymbol{b}), \forall\, \boldsymbol{a}, \boldsymbol{b} \in \boldsymbol{A}, \boldsymbol{y} \in \{+, -\}$

      $\boldsymbol{P}(\boldsymbol{Y} = + \mid \boldsymbol{R} = \boldsymbol{r}, \boldsymbol{A} = \boldsymbol{a}) = \boldsymbol{P}(\boldsymbol{Y} = + \mid \boldsymbol{R} = \boldsymbol{r}, \boldsymbol{A} = \boldsymbol{b}), \forall \boldsymbol{a}, \boldsymbol{b} \in \boldsymbol{A}, \boldsymbol{r} \in \{+, -\}$

    - Impossibility theorem: no more than one of the three fairness metrics can hold at the same time for a well calibrated classifier and a sensitive attribute capable of introducing machine bias (Kleinberg *et. al.* 2016)
      - At present, machines are not capable of conducting trade-offs that would resolve this problem in a socially (legally) acceptable manner

THANK YOU