

# Uncovering Housing Discrimination:

## Cautionary Tales from a Large-Scale Field Experiment via Immoscout24

Zaza Zindel<sup>1,2</sup>, Long Nguyen<sup>1,2</sup>, Stefanie Hechler<sup>3</sup>, Elisabeth Zick<sup>3</sup>

<sup>1</sup> German Centre for Integration and Migration Research (DeZIM), <sup>2</sup> Bielefeld University, <sup>3</sup> Freie Universität Berlin

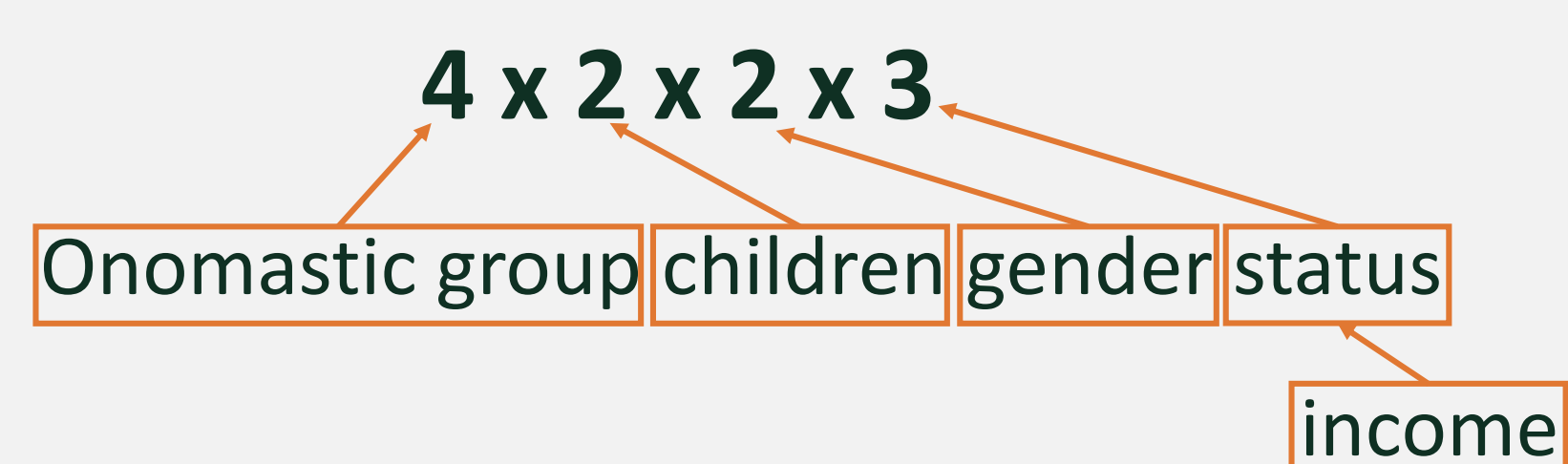
Contact: [zindel@dezim-institut.de](mailto:zindel@dezim-institut.de)

### OBJECTIVE

To analyze discrimination in the online housing market by conducting a large-scale field experiment on ImmoScout24, comparing landlords' reactions to housing applications differing in applicant names, genders, and socio-economic profiles.

## 1 EXPERIMENTAL DESIGN

- Hierarchical (nested) factorial design with four main factors:



- Onomastic group:** Middle East and North Africa, Southeast Asia, Sub-Sahara Africa, German
- Children in household:** yes, no
- Gender of applicant:** male, female
- Social class operationalized by occupational status:** low, medium, high

Example inquiry message:



Sehr **geehrte Frau VERMIETERIN**,

wir, **meine Frau und ich**, haben großes Interesse an der von Ihnen angebotenen Wohnung und würden uns sehr freuen, zu einem Besichtigungstermin eingeladen zu werden.

Wir haben **keine Kinder**, rauchen nicht und haben keine Haustiere. Ich arbeite als **Architekt**, während meine Frau als **Physiotherapeutin** tätig ist. Unser gemeinsames monatliches Einkommen beträgt **ca. 4.600 € netto**.(...)

Mit freundlichen Grüßen,

**Bilal** und **Samira Ahmad**

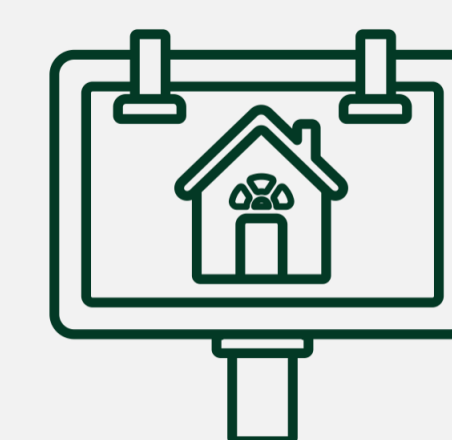


### Ethic Approval:

A detailed ethics concept was developed to protect both landlords and applicant groups. Sufficient lead time was required to align with ethics committee review schedules and ensure responsible study conduct.

## 2 SELECTION OF HOUSING LISTINGS

- Regions:** 1 of ~~100~~ → 1 of **10** selected regions
- Rent Price:** €1,000-2,300
- Size:** At least 45 m<sup>2</sup>, 2-6 rooms
- Rental Type:** Monthly rent
- Exclusion Criteria:** Swap flats, new construction projects
- Page Sorting:** Most recent first



Example URL:

```
www.immobilienscout24.de/Suche/de/bayern/muenchen/wohnung-mieten?numberofrooms=2.0-6.0&price=1000.0-2300.0&livingspace=45.0-&exclusioncriteria=projectlisting, swapflat&pricetype=rentpermonth&sorting=2
```

### Automation: flathunter<sup>1</sup> (GitHub-Repository)

After an initial period during which automated collection of housing listings functioned effectively with the help of 2Captcha<sup>2</sup> to bypass captcha protection, ImmoScout24's bot detection system was modified, making the use of 2Captcha and thus our automated approach obsolete.



### Supplemented with manual implementation

For over six weeks, the project team manually selected housing advertisements and sent application requests.

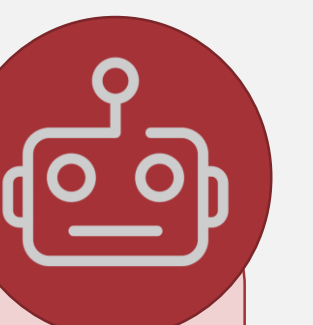
## 3 EMAIL RESPONSES

- Emails sent and received via a custom DeZIM domain (**mail-inbox.online**)
- Automated dispatch of emails through the **Mailgun<sup>3</sup> API**
- Incoming email responses manually categorized
- Additional variables created from responses:
  - Automated Replies:** Yes/No
  - Request for Additional information:** Yes/No
  - Invitation for Viewing:** Yes / Possible / No
- Automation of Response Processing:** The script loads a outlook-export.CSV file containing the email responses and identifies the previously assigned email category based on the sender and subject.



### Caution:

Avoid being classified as a bot by limiting the rate of automatic email replies!



### DATA SET

These three data sources ultimately result in a structured data set that provides initial insights.

1

VARs from experiemental design

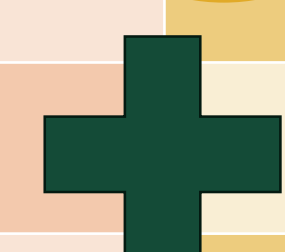
2

VARs from the housing ads

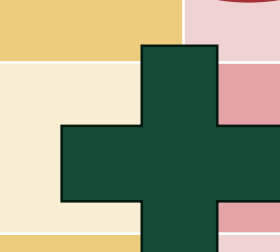
3

VARs from responses

96 contact profiles



2.304 housing inquiries sent



1.310 responses

587 invitations, 306 rejections  
(remaining emails indicate ongoing process as of January 2025)

Scan

to view online



### References

<sup>1</sup>flathunters. (n.d.). *flathunter* [GitHub repository]. GitHub. <https://github.com/flathunters/flathunter>

<sup>2</sup>2Captcha. (n.d.). 2Captcha: Human-powered CAPTCHA solving service. <https://2captcha.com>

<sup>3</sup>Mailgun Technologies. (n.d.). Mailgun. <https://www.mailgun.com>