



Introducing openESM: A database of openly available experience sampling datasets

Björn Siepe¹

February 24th, 2026

¹Psychological Methods Lab, Department of Psychology, Philipps-Universität Marburg

ESM Research: Scattered Landscape

ESM Research: Scattered Landscape

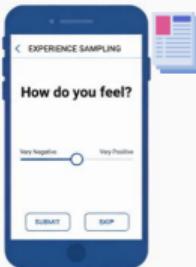


N = 150
Affect

ESM Research: Scattered Landscape



N = 150
Affect



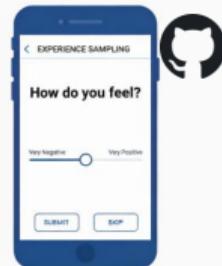
N = 104
Life Events

Logos from (Freepik, 2025a,b; Google, 2025; GitHub, 2018)

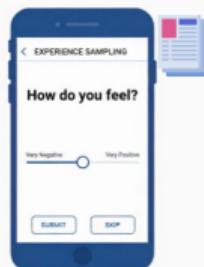
ESM Research: Scattered Landscape



N = 150
Affect



N = 79
Personality



N = 104
Life Events

Logos from (Freepik, 2025a,b; Google, 2025; GitHub, 2018)

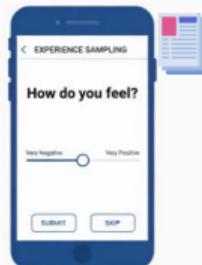
ESM Research: Scattered Landscape



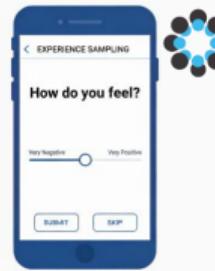
N = 150
Affect



N = 79
Personality



N = 104
Life Events



N = 243
Depression

Logos from (Freepik, 2025a,b; Google, 2025; GitHub, 2018)

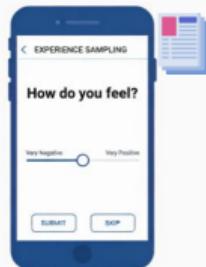
ESM Research: Scattered Landscape



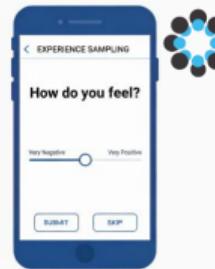
N = 150
Affect



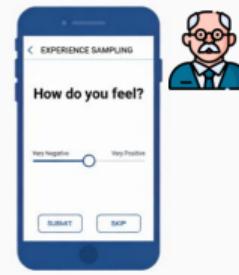
N = 79
Personality



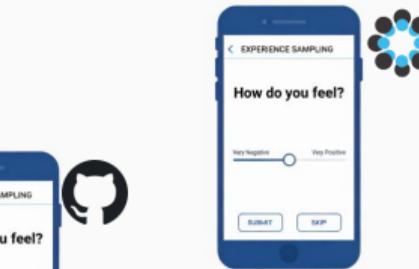
N = 104
Life Events



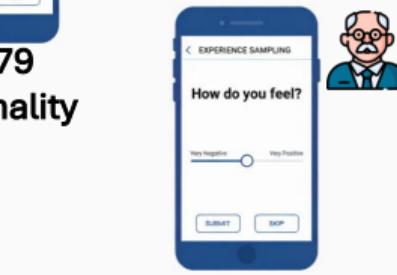
N = 243
Depression



N = 150
Work Stress



N = 243
Depression



N = 150
Work Stress

Logos from (Freepik, 2025a,b; Google, 2025; GitHub, 2018)

The Solution: openESM



N = 150
Affect



N = 243
Depression



N = 79
Personality



N = 104
Life Events

N = 150
Work Stress

Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations

¹R logo: <https://www.r-project.org/logo/>

²Python logo: <https://www.python.org/community/logos/>

Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations

 ¹ and  ² packages for easy access

¹ R logo: <https://www.r-project.org/logo/>

² Python logo: <https://www.python.org/community/logos/>

Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations

 ¹ and  ² packages for easy access



Substantive Research

Test theories across contexts

¹ R logo: <https://www.r-project.org/logo/>

² Python logo: <https://www.python.org/community/logos/>

Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations



¹



²

packages for easy access



Substantive Research

Test theories across contexts

Design Research

Optimize measurement
choices

¹R logo: <https://www.r-project.org/logo/>

²Python logo: <https://www.python.org/community/logos/>

Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations

¹²

and packages for easy access



Substantive Research

Test theories across contexts

Design Research

Optimize measurement
choices

Statistical Methods

Benchmark and develop
methods

¹R logo: <https://www.r-project.org/logo/>

²Python logo: <https://www.python.org/community/logos/>

Why This Matters for SEM Research

Why This Matters for SEM Research



Ready-made data for Dynamic SEM

Intensive longitudinal structure for DSEM, mlVAR, network models

Why This Matters for SEM Research



Ready-made data for Dynamic SEM

Intensive longitudinal structure for DSEM, mlVAR, network models



Measurement Invariance

Test factor structures across
datasets and populations

Why This Matters for SEM Research



Ready-made data for Dynamic SEM

Intensive longitudinal structure for DSEM, mlVAR, network models



Measurement Invariance

Test factor structures across datasets and populations



Model Comparison

Benchmark models on diverse real-world data

Why This Matters for SEM Research



Ready-made data for Dynamic SEM

Intensive longitudinal structure for DSEM, mlVAR, network models



Measurement Invariance

Test factor structures across datasets and populations



Model Comparison

Benchmark models on diverse real-world data



Replication

Validate findings across independent samples

Live Demo



Home About Datasets Search Documentation

A database of open experience sampling datasets

openESM is a database of harmonized openly available experience sampling datasets. The platform enables easy reuse of datasets with consistent and detailed metadata standards to advance reproducible research into daily life.

[Start Exploring Datasets](#)



60

Datasets

Explore our growing collection of datasets.



16.000+

Individuals

Obtain insights from thousands of participants.



100+

Constructs

Investigate a diverse range of psychological variables.

Design Process

Design Process



1. Cleaning

Harmonized NAs, removed
redundant columns

E.g., standardized ID, beep, day

Design Process



1. Cleaning

Harmonized NAs, removed redundant columns

E.g., standardized ID, beep, day



2. Harmonization

Same variable names for same questions

E.g., “depressed” across datasets

Design Process



1. Cleaning

Harmonized NAs, removed redundant columns

E.g., standardized ID, beep, day



2. Harmonization

Same variable names for same questions

E.g., “depressed” across datasets



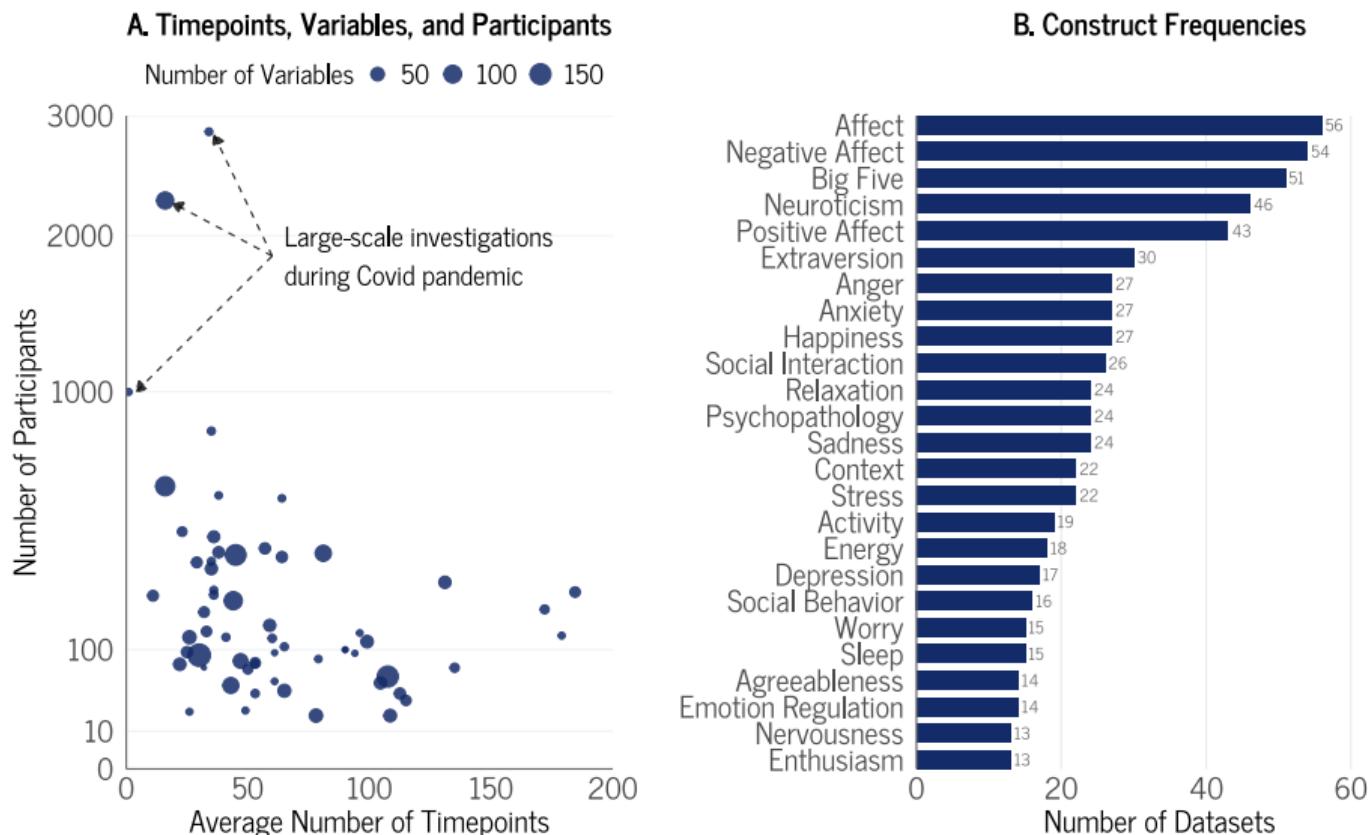
3. Annotation

Hierarchical construct tags for each item

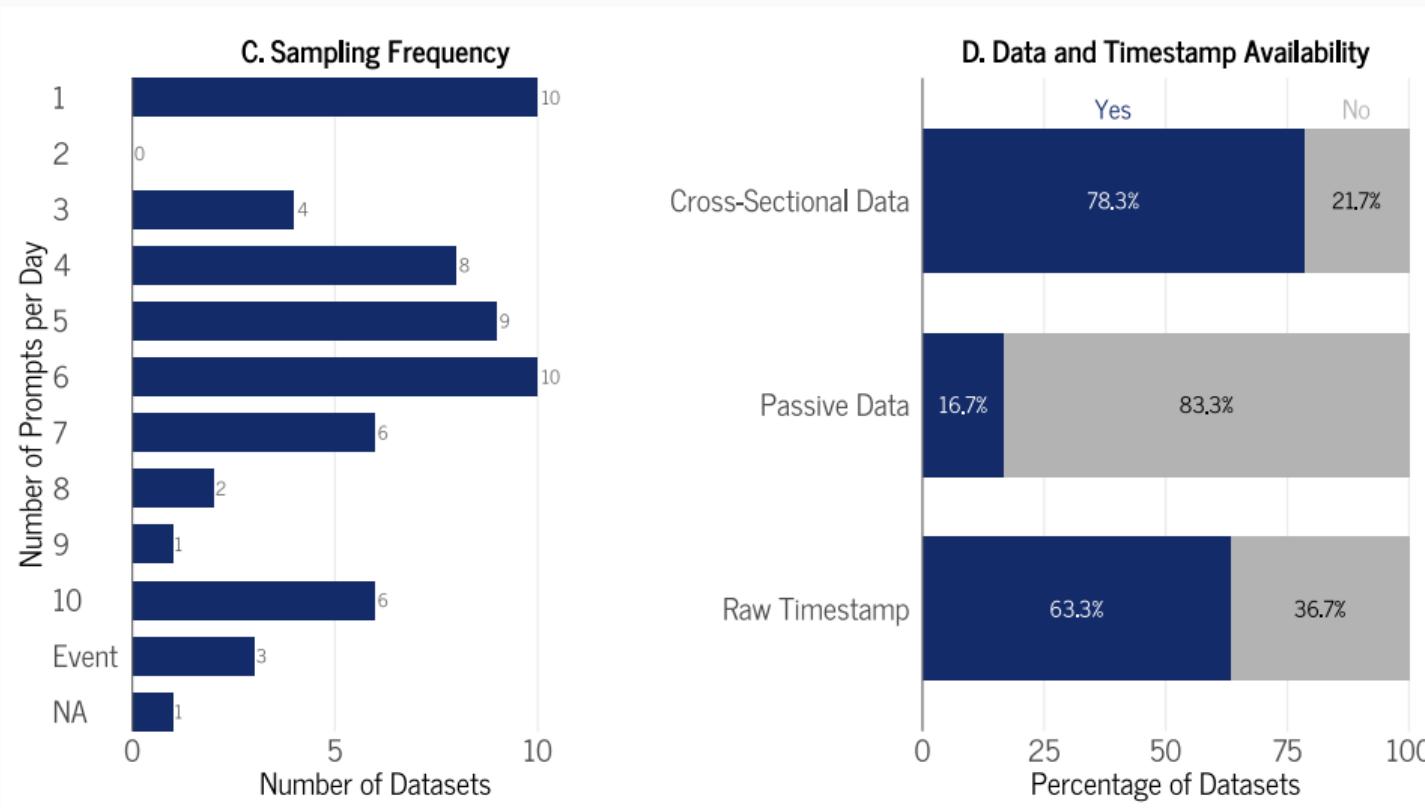
E.g., “angry” → anger, negative affect, affect

What's inside

What's inside

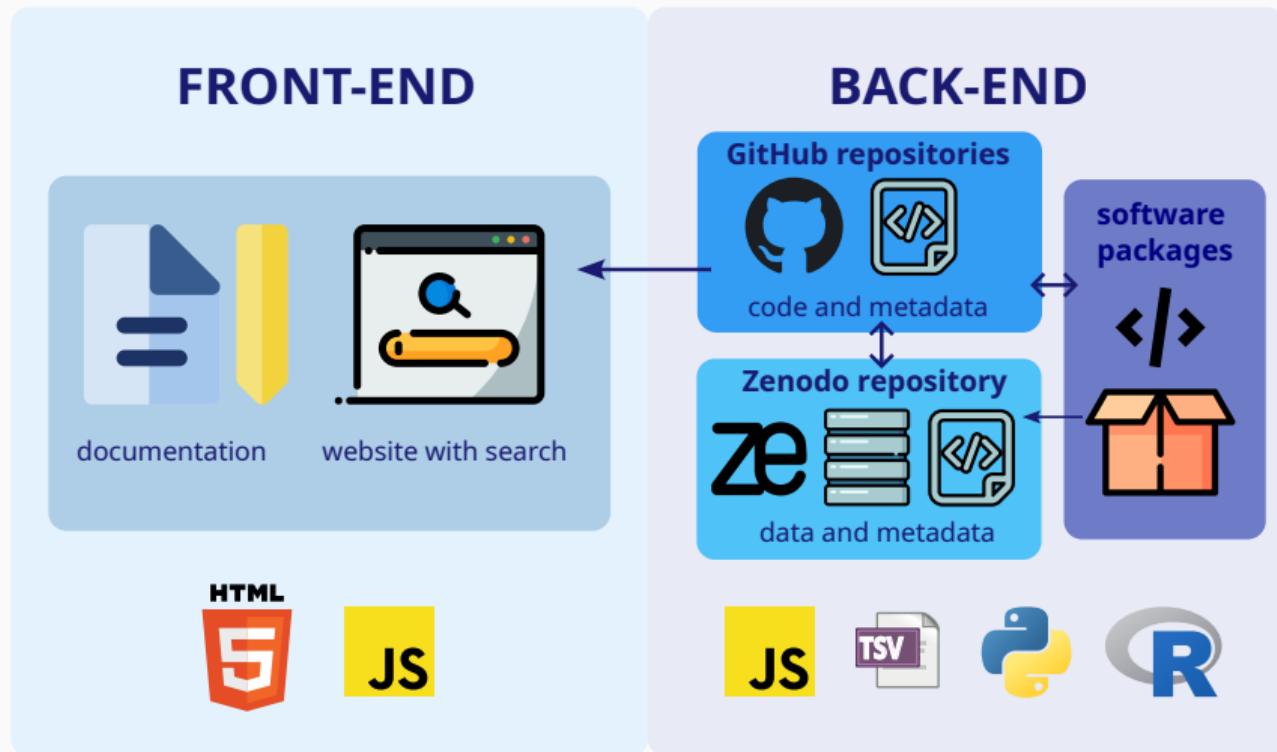


What's inside



Architecture Behind It

Architecture Behind It



Example Analysis

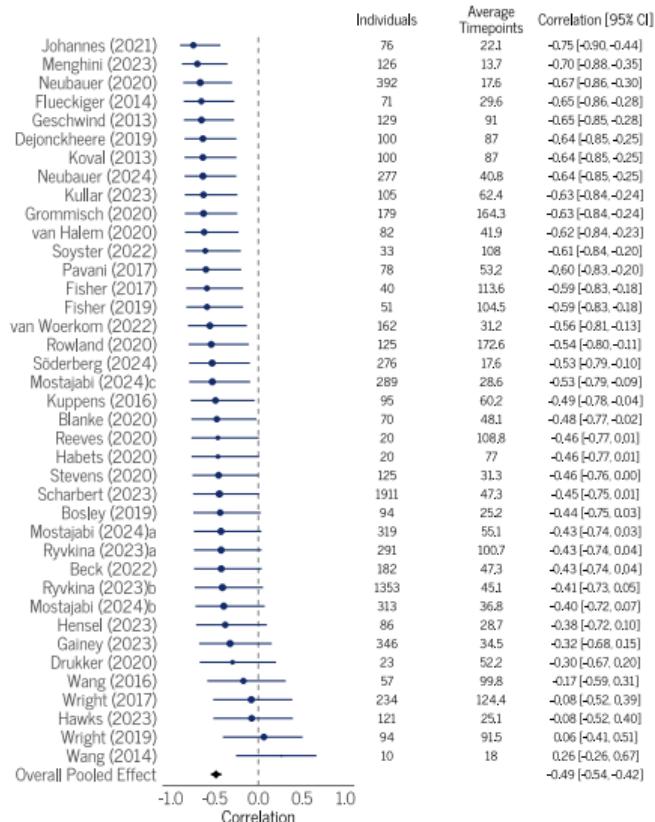
- **Question:** Within-person correlation of positive and negative affect

Example Analysis

- **Question:** Within-person correlation of positive and negative affect
- **Sample:** 39 datasets, 8,456 individuals, 529K observations

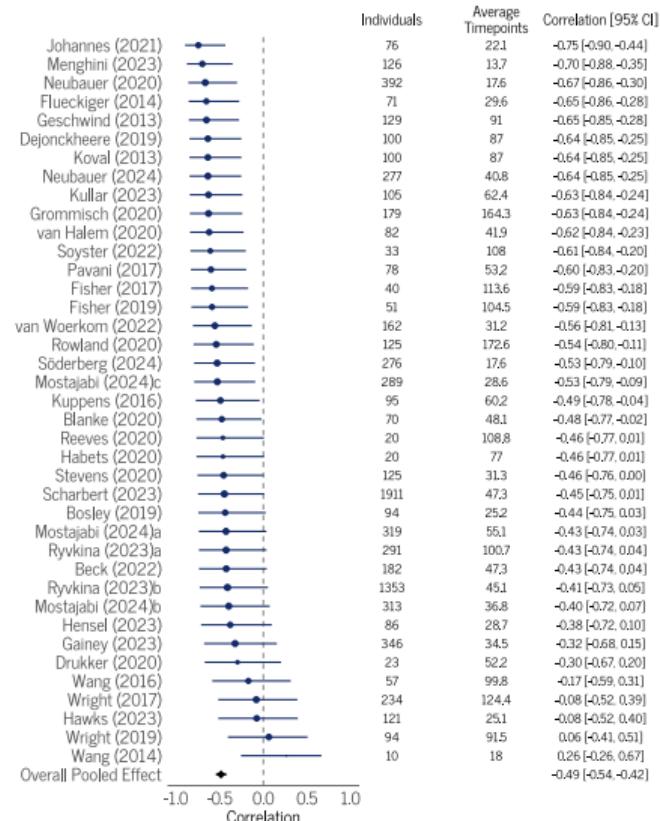
Example Analysis

- **Question:** Within-person correlation of positive and negative affect
- **Sample:** 39 datasets, 8,456 individuals, 529K observations
- **Result:** Pooled $r = -0.49$ [95% CI: $-0.54, -0.42$]



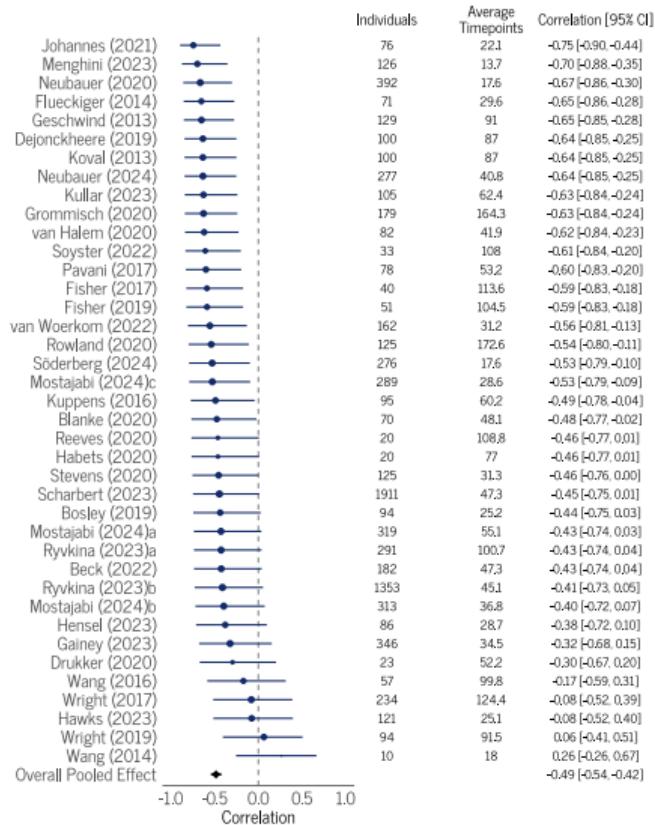
Example Analysis

- **Question:** Within-person correlation of positive and negative affect
- **Sample:** 39 datasets, 8,456 individuals, 529K observations
- **Result:** Pooled $r = -0.49$ [95% CI: $-0.54, -0.42$]
- **Design insight:** More prompts/day → stronger negative correlation



Example Analysis

- **Question:** Within-person correlation of positive and negative affect
- **Sample:** 39 datasets, 8,456 individuals, 529K observations
- **Result:** Pooled $r = -0.49$ [95% CI: $-0.54, -0.42$]
- **Design insight:** More prompts/day → stronger negative correlation
- **Robustness:** Stable across 12 preprocessing/modeling choices



Next Steps

Next Steps



Community

Involve researchers, expand
non-WEIRD data

Next Steps



Community

Involve researchers, expand
non-WEIRD data



Data & Metadata

Extend coverage and
documentation

Next Steps



Community

Involve researchers, expand
non-WEIRD data



Data & Metadata

Extend coverage and
documentation



Software

Add benchmarking and
filtering tools

Next Steps



Community

Involve researchers, expand
non-WEIRD data



Data & Metadata

Extend coverage and
documentation



Software

Add benchmarking and
filtering tools

Goal: Turn openESM into a continuously evolving community resource for
cumulative ESM research

Thanks to the team



Jonas Haslbeck



Matthias Kloft



Anabel Büchner



Yong Zhang



Eiko Fried

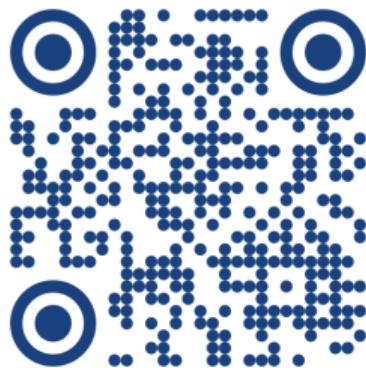


Daniel Heck

Get In Touch

-  bjoern.siepe@uni-marburg.de
-  <https://bsiepe.github.io/>
-  bsiepe

Paper & Slides



References i

- Freepik (2025a). Article Icon. URL <https://www.flaticon.com/free-icons/article>. Accessed: November 17, 2025.
- Freepik (2025b). Old Icon. URL <https://www.flaticon.com/free-icons/old>. Accessed: November 17, 2025.
- GitHub (2018). GitHub Octicon Logo. URL <https://commons.wikimedia.org/wiki/File:Octicons-mark-github.svg>. Licensed under MIT License <http://opensource.org/licenses/mit-license.php>; Accessed via Wikimedia Commons.
- Google (2025). Experience sampling visualization on smartphone. Image generated by Gemini 2.5 based on user prompt. Accessed: November 17, 2025.