

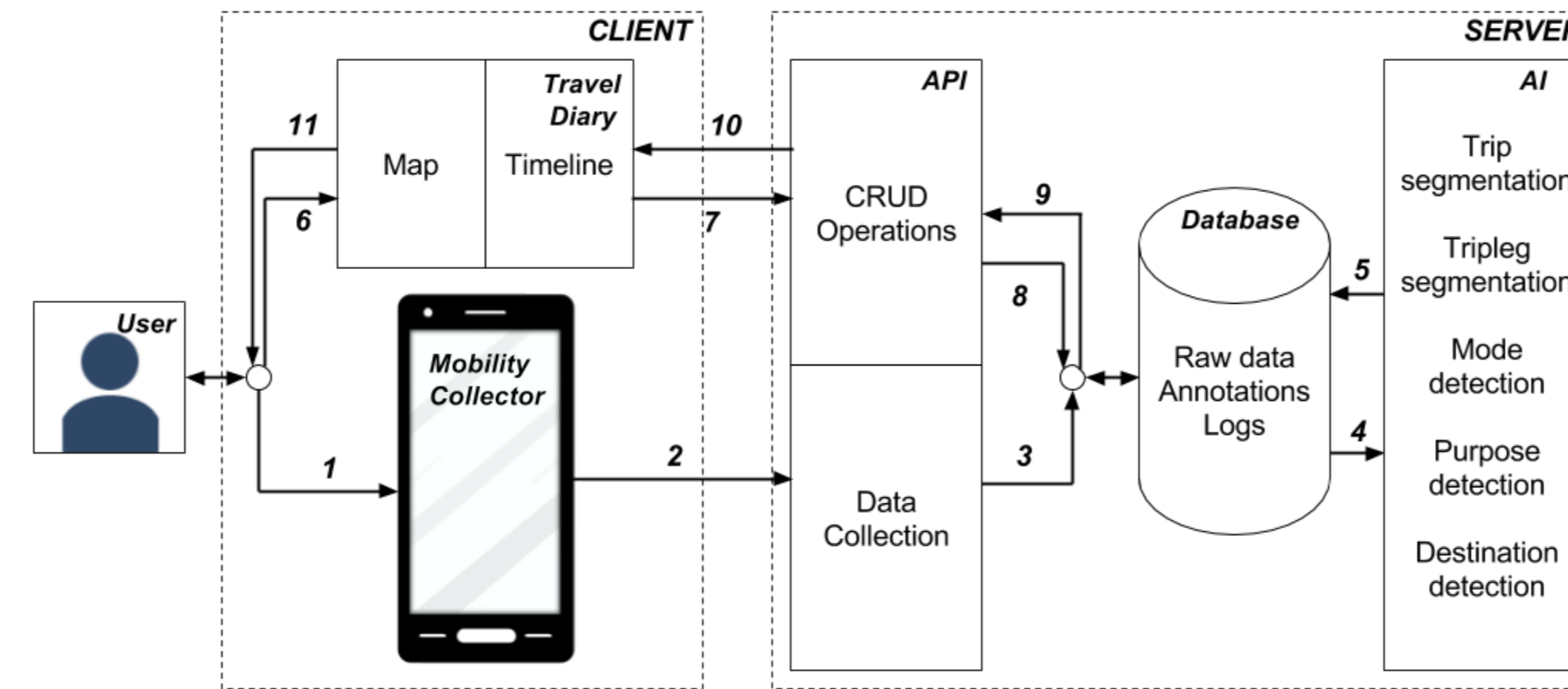


Three case studies on the semi-automation of activity travel diary generation using smartphones

Introduction

Researchers have collected travel diaries as a proxy for travel behaviour by using traditional methods that are gradually losing their reach on a changing population. This poster explores the automated collection of travel diaries.

Annotation process



Overall user experience summary

- Good battery life
- Easy to install the mobile app (both on Android and iOS)
- Difficult to understand domain specific terminology
- Difficult to annotate the data via the existing User Interface
- Need major UI / UX improvements

Case studies overview

	CS I	CS II	CS III
Start date	14.11.2013	29.09.2014	02.11.2015
End date	24.11.2013	05.10.2014	09.11.2015
# PP part.	N/A	42	415
# MEILI part.	11	30	171
# PP & MEILI part.	N/A	28	83
# Feedback answers	N/A	34	303
Median age	N/A	40	42
# Raw GPS	22,000	91,000	970,000
# Annot. GPS	15,000	66,000	322,000
# Annot Trips	156	718	2,132
# MEILI trips Comp.	N/A	87	355
# PP trips Comp.	N/A	94	278
Observations	Small sample	Respondent bias	Large field trial

Descriptive collection statistics

		PP and MEILI	PP Only	MEILI Only	
Duration (min)	CS II	24 ± 19	23 ± 20	64 ± 85 (20)	
	CS III	25 ± 23	26 ± 26	173 ± 429 (12)	
Length (km)	CS II	6.3 ± 6	4.5 ± 5	3.8 ± 5.1	
	CS III	11.8 ± 18	20 ± 7	13 ± 46	
# triplegs	CS II	1.8 ± 1	1.7 ± 1.1	1.2 ± 0.3	
	CS III	1.9 ± 1.3	1.6 ± 1	1.4 ± 0.8	
Time Indicator	MEILI Obs.	CS II	43% ± 30%	N/A	48% ± 30%
		CS III	62% ± 31%	N/A	48% ± 37%
	PP Decl.	CS II	46% ± 32%	32% ± 36%	N/A
		CS III	55% ± 29%	47% ± 30%	N/A
Distance Indicator	MEILI Obs.	CS II	63% ± 37%	N/A	73% ± 35%
		CS III	71% ± 33%	N/A	71% ± 35%
	PP Decl.	CS II	68% ± 35%	47% ± 43%	N/A
		CS III	71% ± 34%	69% ± 34%	N/A

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Traditional travel diary collection steps



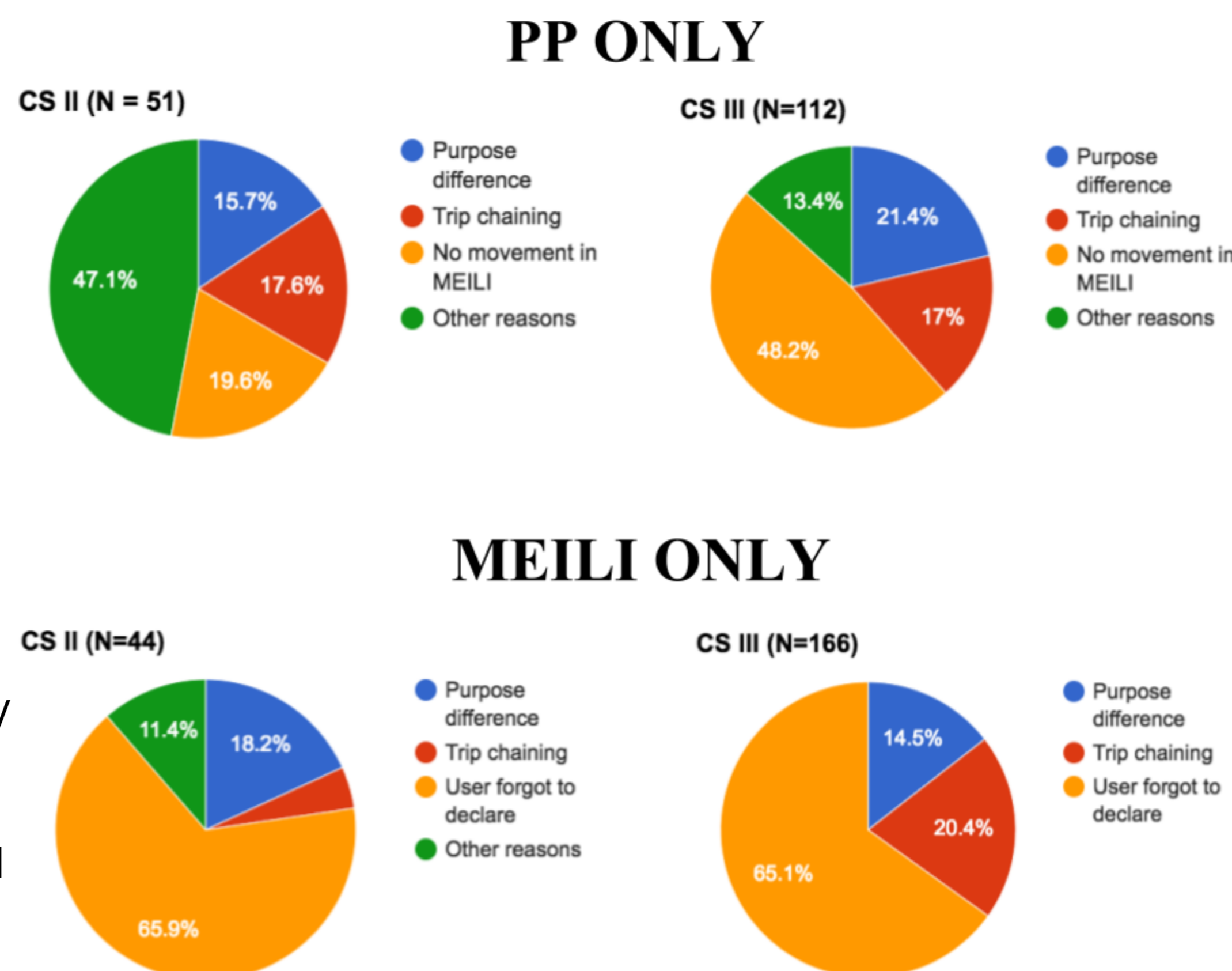
Pros

- Easy to design a basic survey
- People are used to filling up surveys
- Already accepted by transport agencies

Cons

- Decreasing response rate
- Needs data cleaning
- Depends on respondent memory
- Limited reusability

Collection type specific trip distribution



Conclusions

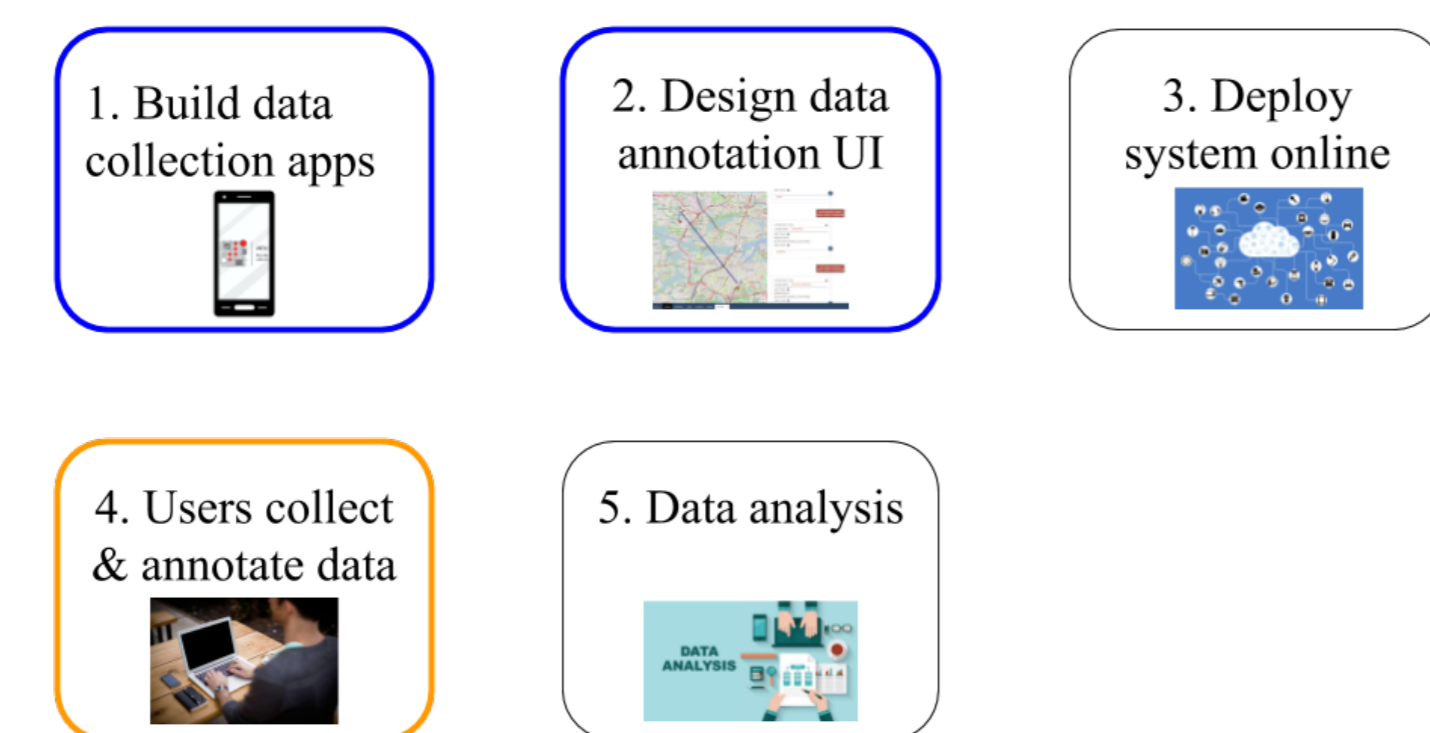
The three case studies that were ran during a one week period in three different years show the validity of using MEILI for collecting travel diaries, and the continuous improvements of MEILI for the associated three year period.

The availability of an open source system that enables the collection of GPS points fused with accelerometer readings and their annotation into travel diaries enables a wider pool of people interested in travel behavior to collect data with no overhead. The MEILI system is released under a GPL license to facilitate the availability of any progress on MEILI to the community, thus allowing for a faster convergence towards a widely accepted system for collecting travel diaries.

Github repositories for source code

Web Annotation Interface and API - <https://github.com/Badger-MEILI/MEILI-Travel-Diary>
Data collector for Android devices - <https://github.com/Badger-MEILI/MEILI-Mobility-Collector-Android>
Data collector for iOS devices - <https://github.com/Badger-MEILI/MEILI-Mobility-Collector-iOS>
Database - <https://github.com/Badger-MEILI/MEILI-Database>

Automate travel diaries



Pros

- Reusable
- Centralized data
- No need for data cleaning
- Long periods of time data collection
- Decrease user fill in burden by task automation (ML, AI)

Cons

- Implementation difficulty
- Needs a customer retention strategy
- Hosting and operational costs
- Scalability limited by chosen implementation and architecture

IN COOPERATION WITH:

