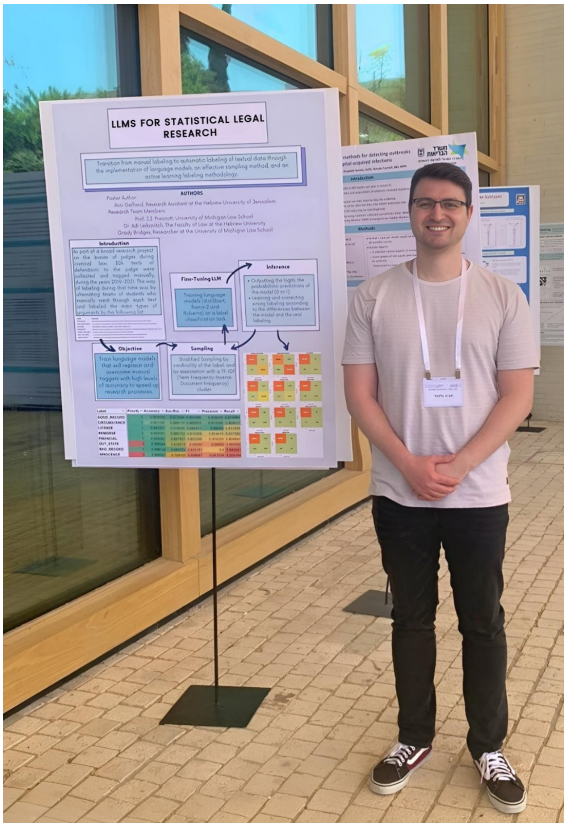


# Check Out My Favorite Projects:

- **Fine-tuning Large Language Models** such as llama-2-7B, llama-2-7B-instruct, and some lighter models like RoBERTa, DistilBERT, and others for labeling texts in my role as NLP Data Scientist at HebrewU.



The photograph shows a man in a white t-shirt and dark pants standing next to a large poster. The poster is titled "LLMS FOR STATISTICAL LEGAL RESEARCH" and contains text, diagrams, and a table of results. The man is smiling and looking at the camera.

### LLMS FOR STATISTICAL LEGAL RESEARCH

Transition from manual labeling to automatic labeling of textual data through the implementation of language models, an effective sampling method, and an active learning labeling methodology.

**AUTHORS**  
Poster Author: Avir Gelfand, Research Assistant at the Hebrew University of Jerusalem  
Research Team Members: Prof. J.J. Prescott, University of Michigan Law School  
Dr. Adi Leibovitch, The Faculty of Law at the Hebrew University  
Grady Bridges, Researcher at the University of Michigan Law School

**Introduction**  
As part of a broad research project on the biases of judges during criminal law, 30k texts of defendants to the judge were collected and tagged manually, during the years 2019-2021. The way of labeling during that time was by alternating teams of students who manually went through each text and labeled the main types of arguments by the following list:

**Objective**  
Train language models that will replace and overcome manual taggers with high levels of accuracy to speed up research processes.

**Sampling**  
Stratified Sampling by cardinality of the label, and by association with a TF-IDF (Term Frequency-Inverse Document Frequency) cluster.

**Fine-Tuning LLM**  
Training language models (distilbert, llama-2 and Roberta) on a label classification task.

**Inference**  
• Outputting the logits, the probabilistic predictions of the model (0 to 1).  
• Learning and correcting wrong labeling according to the differences between the model and the real labeling.

Label	Priority	Accuracy	Auc-Roc	F1	Precision	Recall
GOOD_RECORD	1	0.973115	0.973548	0.951384	0.929316	0.974468
CIRCUMSTANCE	1	0.901445	0.905173	0.900312	0.910389	0.908037
LICENSE	1	0.961311	0.916055	0.888421	0.950545	0.833892
REMOUSE	1	0.909107	0.888753	0.916359	0.824675	0.837562
FINANCIAL	1	0.954282	0.907627	0.902548	0.804255	0.910847
OUT_STATE	3	0.989544	0.838678	0.68099	0.688332	0.682892
BAD_RECORD	1	0.996129	0.980232	0.645161	0.0	0.540541
INNOCENCE	3	0.990507	0.709102	0.600587	0.663389	0.508184

- **Driver Behavior Detection Using Smartphone Signals** - A Signal Detection project applying ML to identify risky driver behavior, based on academic publications and open source data-sets.

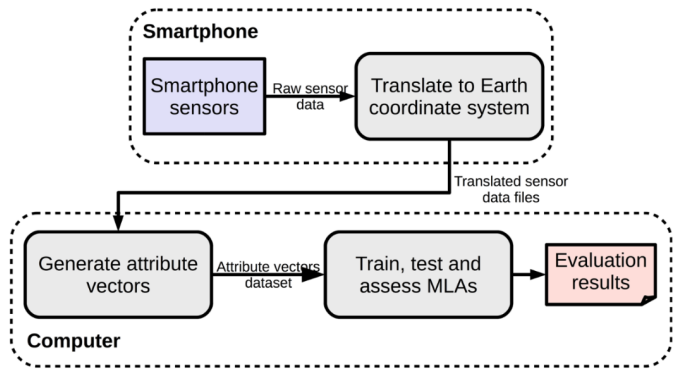
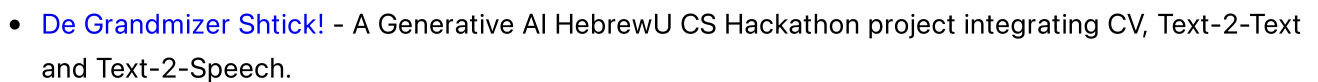
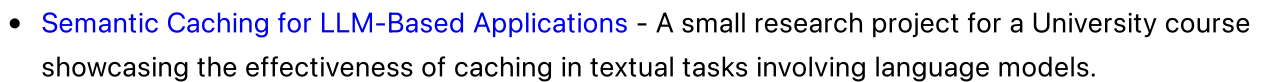
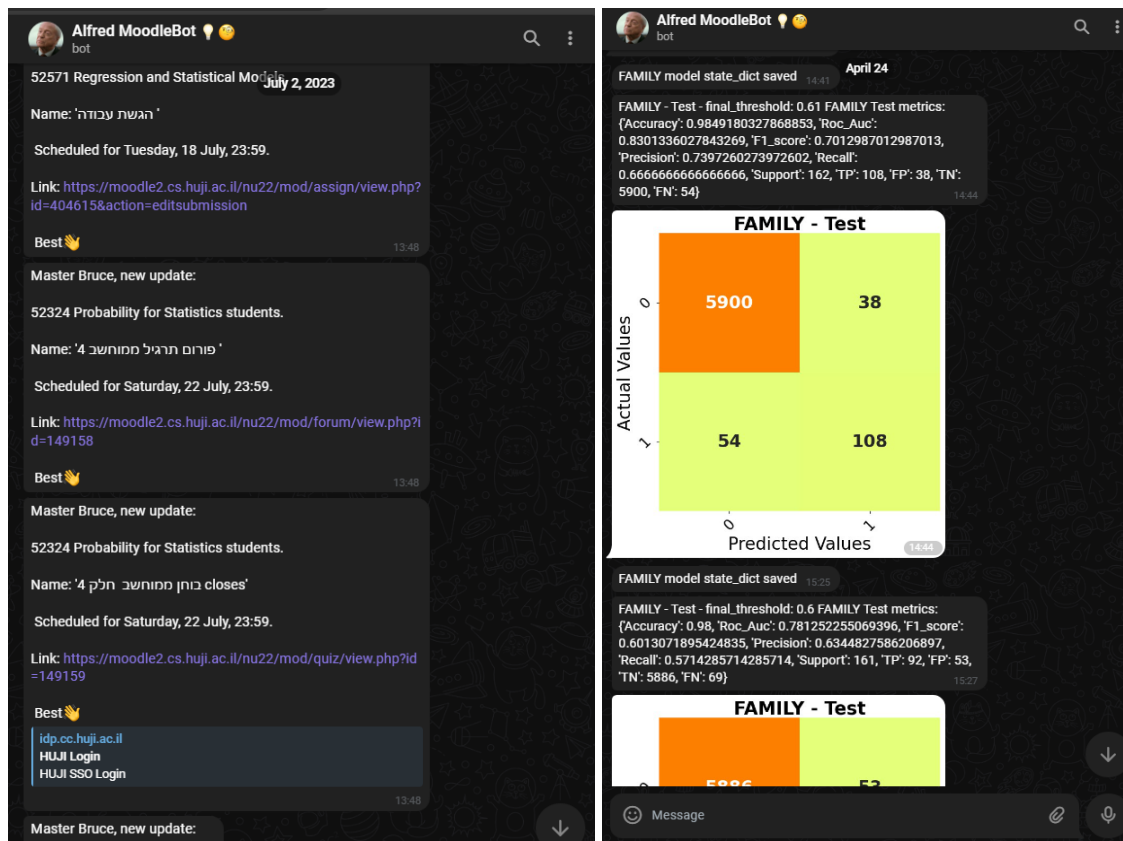


Fig 1. High level view of our evaluation pipeline showing processing steps from raw sensor data sampling to training, testing, and assessing MLs.  
<https://doi.org/10.1371/journal.pone.0174959.g001>

- **Geometry of Information Course Tasks** - covering kernel-based methods, spectral graph theory, clustering algorithms (K-means, Spectral), manifold learning, and graph signal processing.



- **Alfred** 🤖, a Personal Assistant that **Scarpes and notifies on telegram** for new tasks on university moodle site. It also proved to be very useful when running scripts for a long time and wanting to get alerts and updates remotely.



- **Predicting Song Popularity** using various Machine Learning Regression Models.
- **A Deeper Learning of Deep Learning** - trying to visualize and learn about how weights are being shaped.
- A project in **Textual Statistical Analysis, Sampling, and Statistical Inference**.
- Final Exam in Data Analysis with R course - **Analysis and visualization of earthquake geographical data**.