

Project Proposal: Bus Time Monitor (1DT086/1DT032)

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What? We propose to develop a bus departure time monitor, hypothetically to be placed on the wall next to the exit of the Ångström Laboratory. The Sense HAT display will show the time until the next bus departs from the nearby 'Uppsala, Polacksbacken' bus stop.

Motivation We believe this project addresses a real need of people commuting from the ITC faculty. Also, the project is interesting from a technical point of view, because it has many challenging aspects (see subgoals section).

Subgoals / Requirements We define the following subgoals:

- **Display information** Show and update information (bus line number and departure times) for the bus on Sense HAT LED display
- **Static data** Read data from a static bus schedule file
- **User input** Use Sense HAT joystick to switch between different bus-lines and directions
- **Real-time data (optional)** Fetch real-time data from external web service

How? We will use Python as the primary programming language, and its Sense HAT API for interacting with the LED display and joystick. We will also (probably) make use of the Google Directions API (if the real-time data feature is added).

Potential obstacles A potential obstacle with real-time data is that (according to our preliminary research) Google doesn't seem to expose an API for returning public transit schedule data of a specific place. Instead they should be somehow gotten via way of a request for directions from point A to B. Also, we want to avoid a high billing for these API calls.

When? We have roughly five weeks to deliver the project, presentation and report:

- **Week 1 (1/10-7/10)** Project proposal, further research and requirement definition, set-up dev environment (Python, Git, stable domain name for SSH, Sense HAT python API), add display of single bus line departure time
- **Week 2 (8/10-14/10)** Get and add static bus time schedule, add user input for switching the bus lines, 1st TA meeting, research fetching real-time updates viability
- **Week 3 (15/10-21/10)** 2nd TA meeting, possibly add real-time updates, start on presentations

- **Week 4 (22/10-28/10)** Presentations, start on report, finish code
- **Week 5 (29/10-4/10)** Finish and submit report