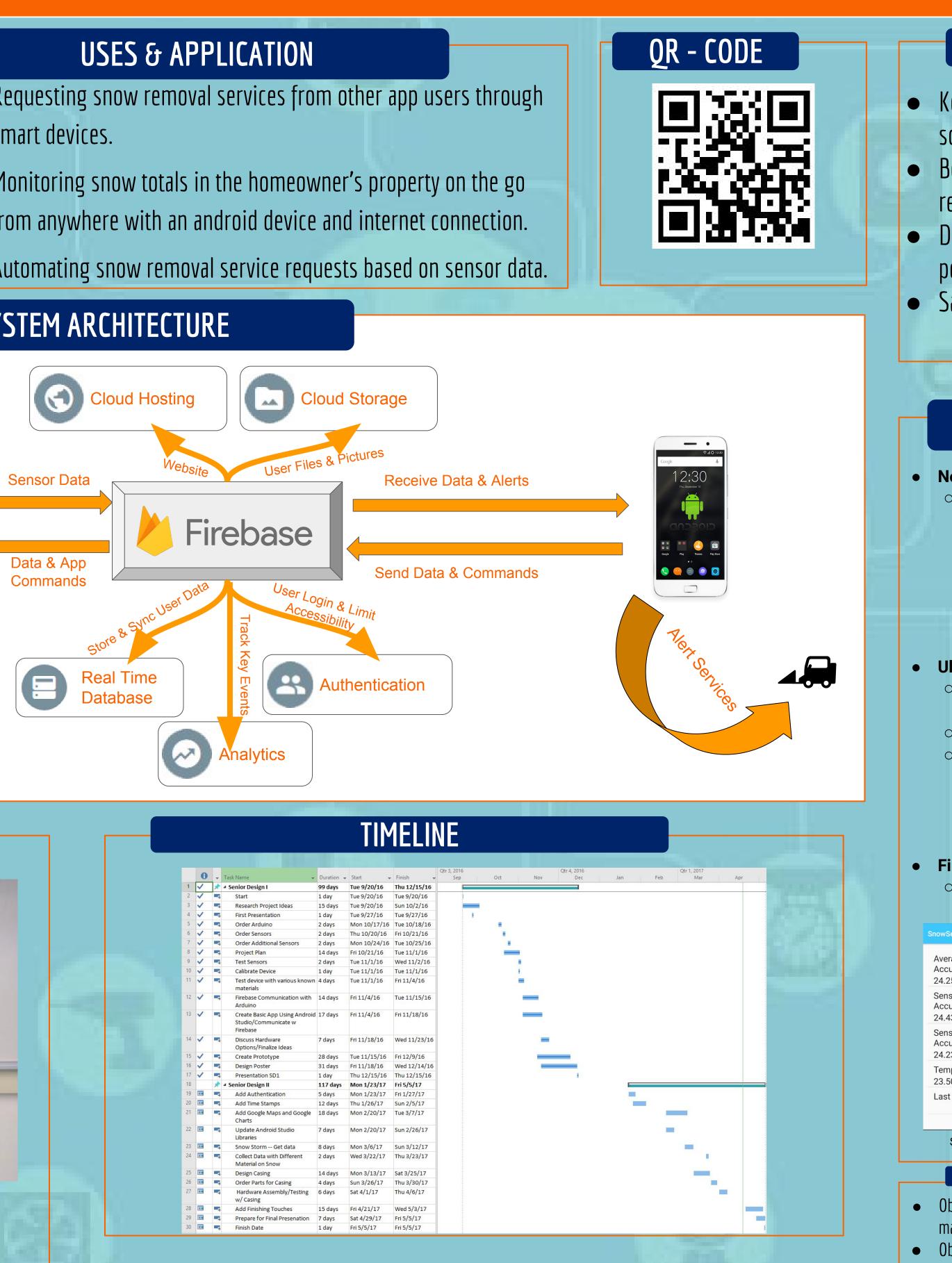
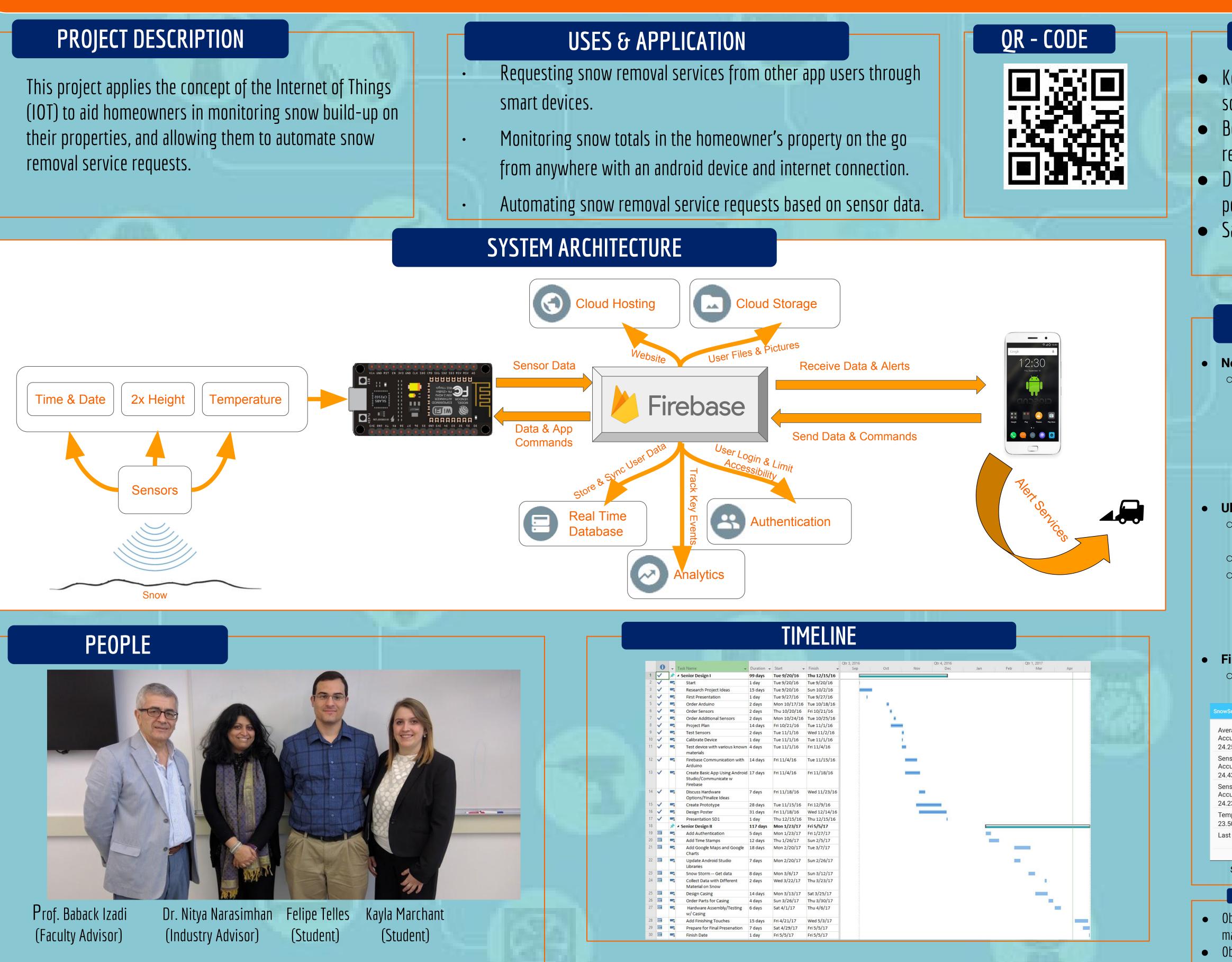
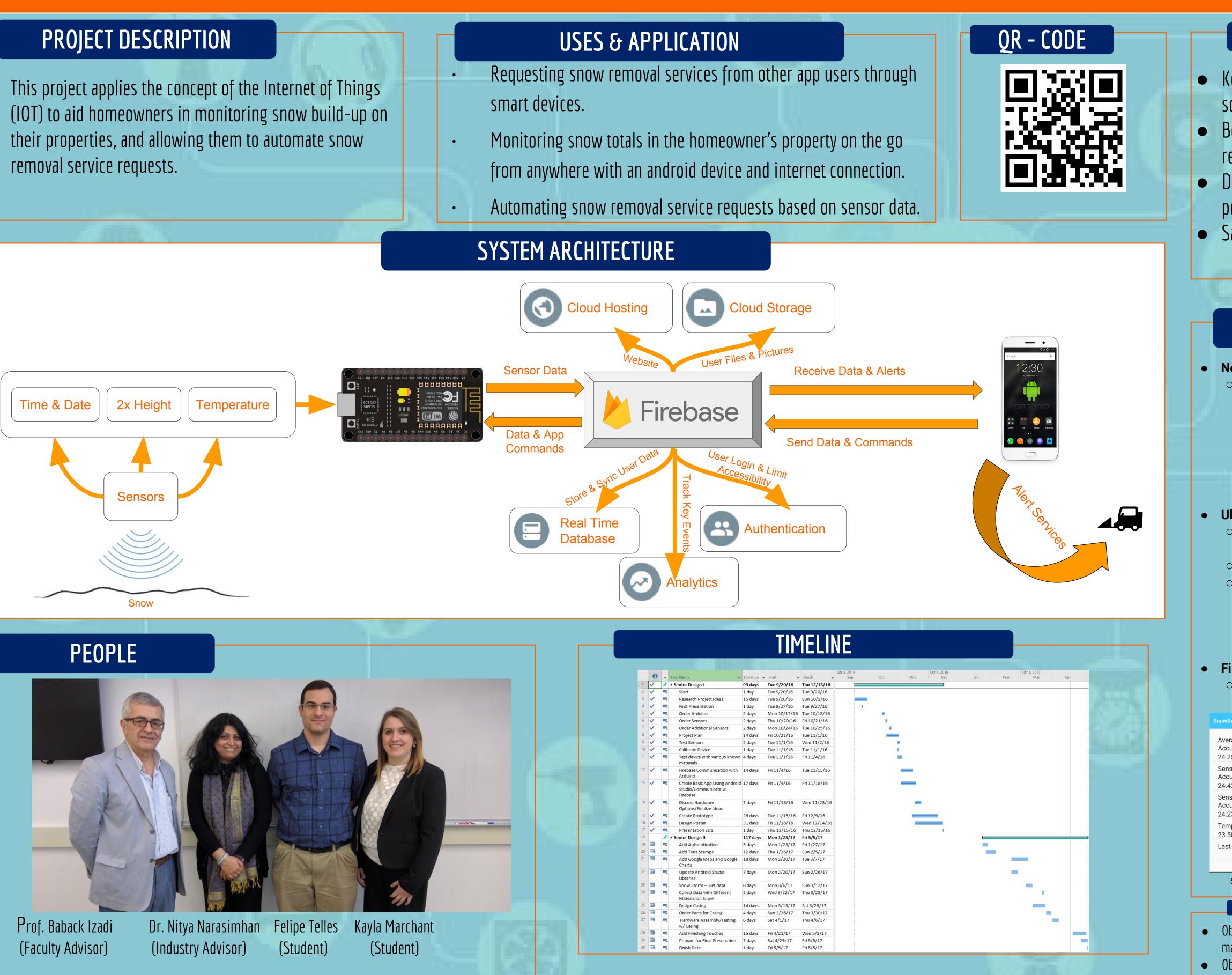
Division of Engineering Programs EGE 409 - Senior Design Project II Spring 2017

Snow-Sense Automating Sensing & On-Demand Service Fulfillment



- smart devices.





WEBSITE http://snow-sense.github.io

STUDENTS: FELIPE TELLES, KAYLA MARCHANT ADVISOR: DR. BABACK IZADI



MANDATED TECHNOLOGY

- Keeping manufacturing price down by using low cost components and open source software in order to make it affordable to homeowners.
- Both Firebase(backend) and Android(frontend) are in constant development, requiring the developer to be aware and familiar with the latest SDK changes. • Device has to be capable of withstanding below freezing temperatures over long periods of time.
- Safe materials in accordance with NESC and IEEE.

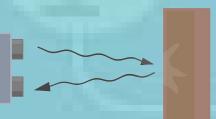
FUNCTIONALITY

NodeMCU Devkit

• Used instead of the project's initially targeted Arduino Uno, as it is much cheaper, includes a ESP8266 WiFi module and is smaller.

Ultrasonic Distance Sensing

- Used as the primary method of determining the height of snow by keeping track of an initial height, and current heights through snowfall.
- A better alternative to infrared sensors. It is a linear device, has a longer range and is not affected by sunlight.
- Two ultrasonic sensors, in addition to a temperature sensor were used in order to validate measurements and increase computation accuracy.
- Firebase & Android



• Chosen as it is a free cloud service and contains plenty of documentation and features. Main features used include database, authentication, storage and analytics. Most of its features are accessed through an Android application.

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Endore			jenna@google.com	Apr	16, 2017	xcD0IM6gN0MY1ERXfkgf4dr0T5v2	type: "sensor'
Sensor Data UI	Driveways & On Duty On-Demand Service User Activity Analytics & Authentication Snowplow Map Requests & Providers						Real-Time Database
FUTURE WORK							

- Obtain or develop higher quality and cost effective ultrasonic sensors capable of outputting sound waves of higher magnitude, increasing measuring range and measurement accuracy against soft objects. • Obtain proper casing material and insulation to extend device's life expectancy.
- Switch to ARM based Microcontroller for improved hardware performance, ADC accuracy and additional features.