DATA LOGGER AND ANALYTICS

Guided by:

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GOALS OF THE PROJECT

- Accurately measuring the greenhouse environment using various sensors such as temperature, humidity, light intensity and pressure.
- Generating real time graphs for the collected data.
- Developing user interface for visualization.
- Designing database for storing sensor readings.
- Analyzing the data in meaningful ways by drawing charts and graph.
- Alerting using SMS/E-mail in critical situations.

TOOLS AND TECHNOLOGIES

- RadioSound Kit :
  - For collecting readings from sensors (Temperature, Pressure and Humidity).
  - RS92-SGP : As Transmitter
  - XT09-SI-NA : As Receiver
- CC430F6137 Kit :
  - For collecting luminosity readings from light sensor embedded within it.
  - MSP430 microcontroller
- NetBeans IDE for developing web application.
- Programming languages used : JAVA, JSP, HTML,CSS
- Used Tera Term and X-CTU terminals for visualizing received serial data.
- RxTx serial communication API for Java.
- Code Composer Studio 5.3.0 for programming MSP430.

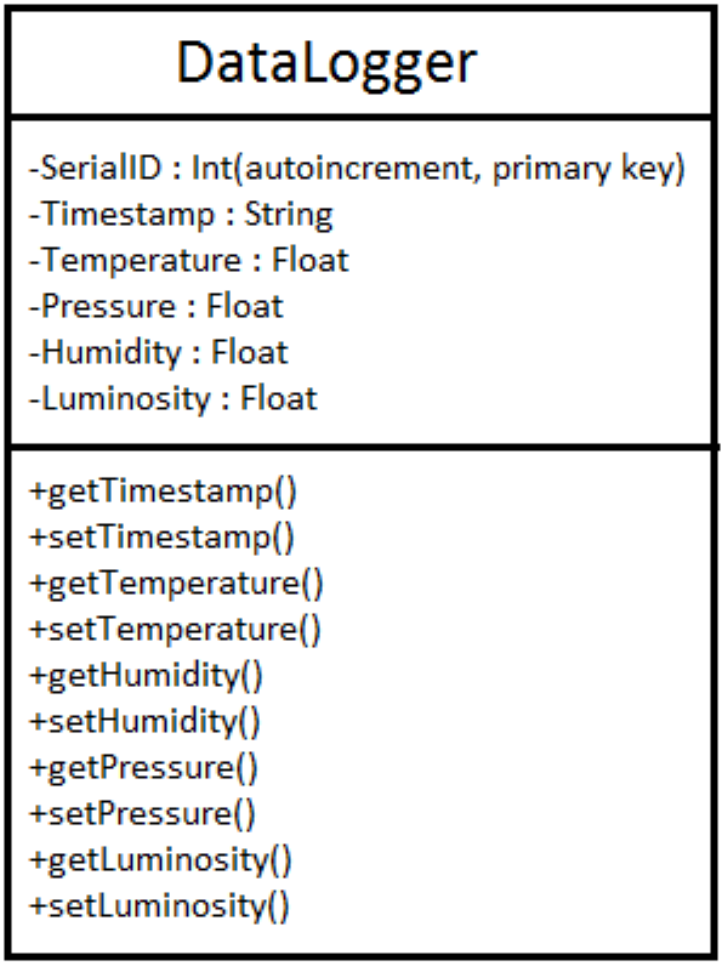
IMPLEMENTATION

- Programmed MSP430 to get light sensor readings.
  - Used UART for serial communication.
- Programmed to establish serial port communication in JAVA.
  - Initially used serial communication API, called JavaComm then switched to RxTx.
- Designed and developed database for the project in MYSQL.
- Created web pages using JSP and CSS(for styling).
- Generated real-time graphs which updates after every 3s.
- Collected 5 days readings of temperature, pressure, humidity and luminosity from GREENHOUSE.

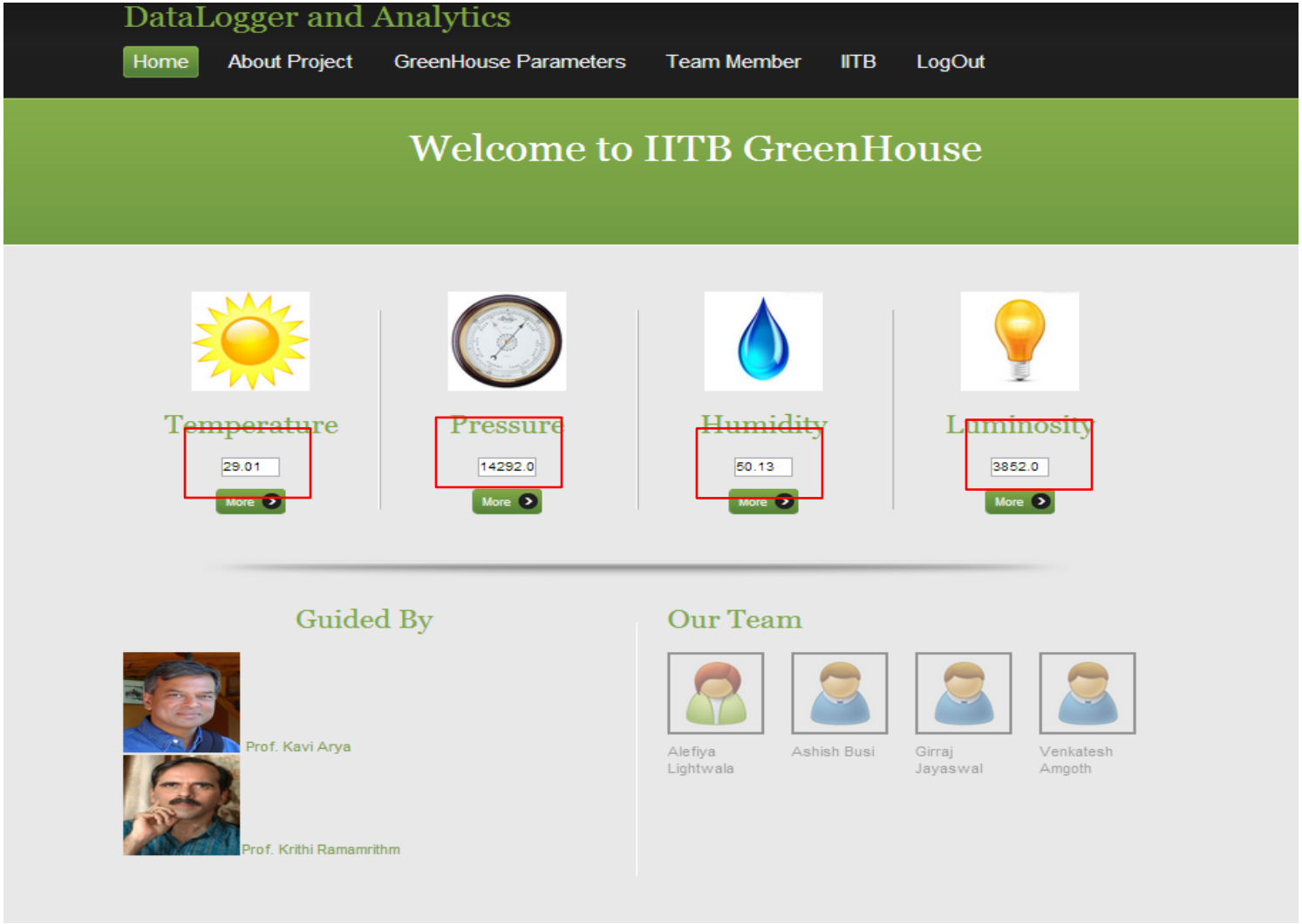
Database description

Database is up to date
with latest data(i.e Real time)

Using two way serial
communication to update
environmental parameters
dynamically



USER INTERFACE



CHALLENGES FACED

- Difficulty in serial interfacing
  - Requires a standardized API with platform-specific implementations.
  - Used free software RxTx.
- Programming MSP430
  - Required thorough knowledge of MSP430
  - Faced problem in interfacing to supply external voltage of 3V as maximum voltage is limited to 2.5V
- Database maintenance
- Generating Real-Time graphs

FUTURE WORK

- Database
  - Infinite streaming data
  - Store summary of old stale data.
- Sending SMS/E-Mail in critical situations(in progress).
- Improving GUI.
- Managing multiple greenhouses using single web application.

THANK YOU

For Coordination and Support, Special Thanks To:

Prashant Rupapara

Vishvanathan Iyyer