Gusty

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Project Concept and Motivation

Gusty is a robotic air vent designed to reduce energy usage

The average U.S. home uses 42.4% of its energy consumption on heating and cooling [1]

Rather than cool or heat an entire house, Gusty only conditions the air around the user

[1] http://en.wikipedia.org/wiki/Energy_conservation_in_the_United_States

Competitors

Nest Learning Thermostat

Intelligent self-scheduling thermostat that saves energy when you are away

AirSketcher

Robotic fan which accurately blows a given target or drawn path

Requirements

Autonomously recognize inhabitants and blow conditioned air in their proximity

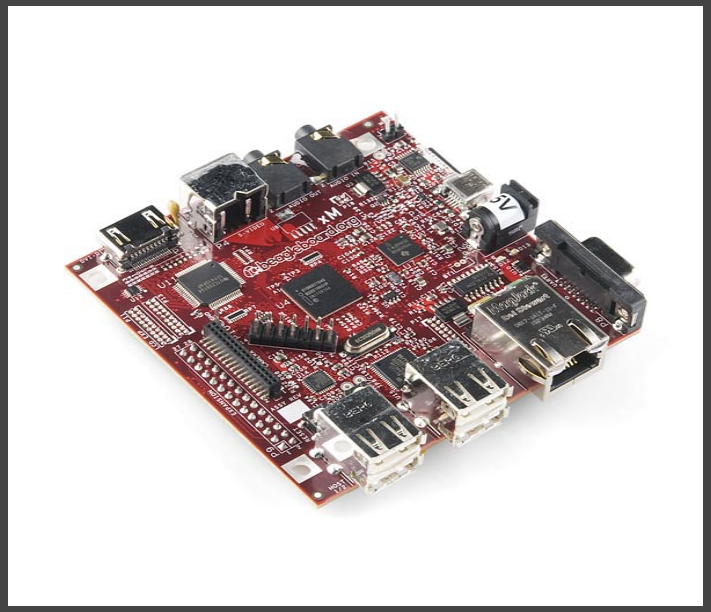
Recognize gestures to adjust temperature, fan strength, and coverage area

Close vents and signal off the thermostat when users leave the room

Learn usage over time to intelligently schedule home and away temperatures

Easily retrofits into existing air ducts in homes

Technical Specifications



BeagleBoard xM

1 Ghz embedded platform for vision processing and web interface

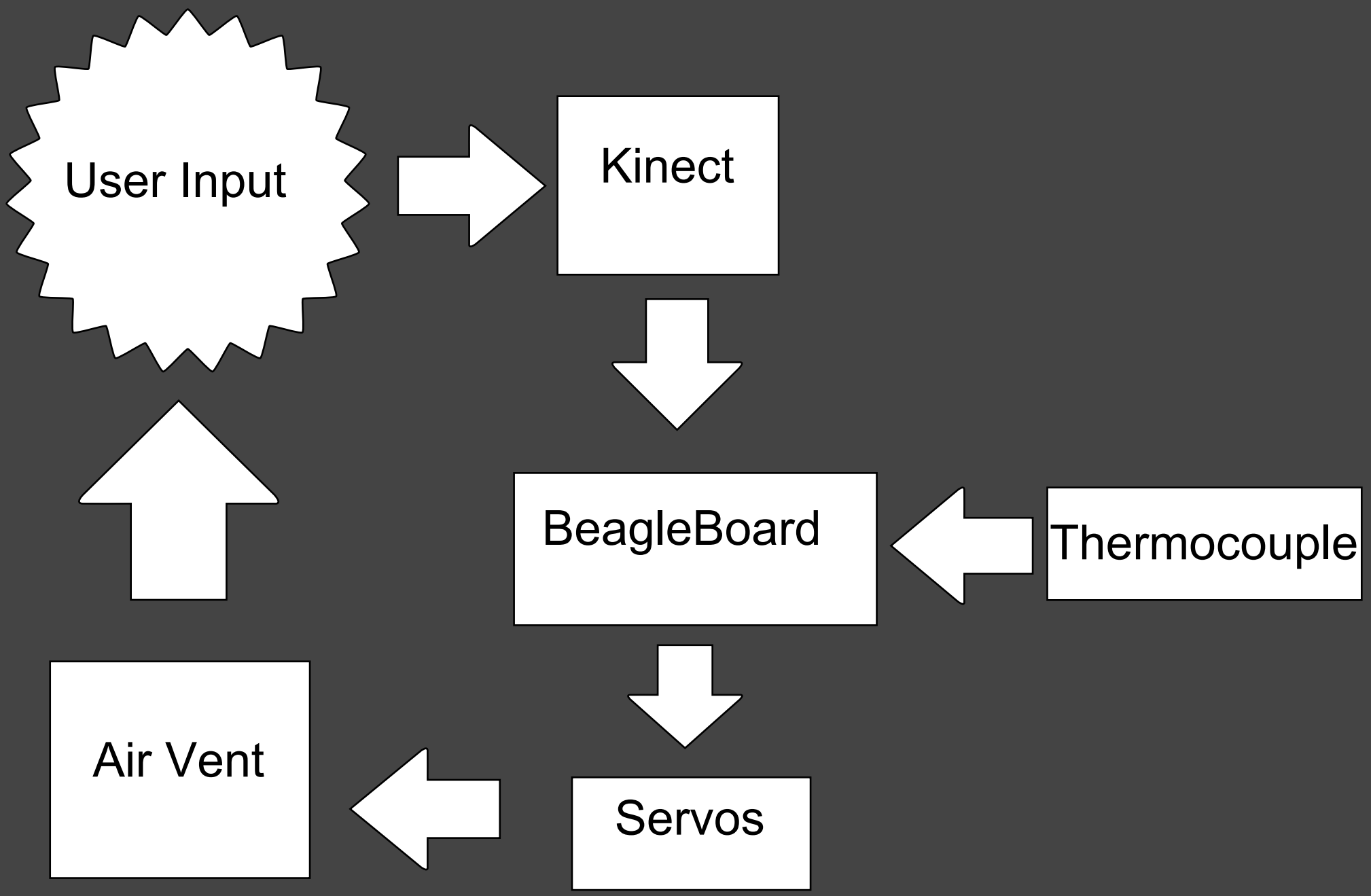
Kinect Sensor

Simplified 3D mapping with body recognition

Standard Air Vent

To be modified with servos for directional control

Architecture



Risks and Mitigation

Kinect does not recognize user
Manual override via physical switch or web interface

Lose wireless connection to web interface
Fall back on latest, base pre-programmed behavior and maintain consistent behavior

No wireless connection to the web interface enabled in house
Override all of Gusty's controls physically

Sudden power loss
Alert user via web or phone, and fall back on base, Gusty-independent thermostat control