Design of a Human-like Robotic Head for a Social Robot
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Problem Definition:
Build a three DOF robotic neck and a robotic face capable of expressing six basic human-like emotions under $1000.

Existing Android Design
Lack of Expressiveness
Uncanniness
Skin Tear
Poor Structural Design
Bulkiness

Objectives
Expressiveness: Communicate the six basic emotions
Durability: Capability to withstand wear and tear
Realism: Resemblance to the human face
Familiarity: Human willingness to interact with robot

Face Design
The 6 basic emotions are generated by animating:
- Eyeballs (Up & Down + Left to Right)
- Eyebrows (Up & Down + Rotate)
- Eyelids (Open & Close)
- Jaw (Up & Down)
- Mouth Corners (Open & Closed)

Neck Design
Nod
Side Tilt
Rotation

Neck with Head Structure
The head structure will be mounted to the neck design by attaching the nod servo block to the base of the head. This servo has been sized to support a higher loading.

Future Work
The lips, lower jaw, eyebrows and eyelids need to be connected to the moving links. The servos must then be programmed to produce the six emotions. The head structure is to be attached to the neck structure.

Conclusion
The team has successfully mounted the servos and links necessary to generate the required motions. The new design is lighter and more compact.

Upon completion, a survey will be conducted to determine the degree to which the objectives were met.