**You are proposing to the company research director to reduce the mass of the prosthetic hand which is the end effector of a full prosthetic arm for a shoulder disarticulation patient.  What are some of the reasons for funding this proposal that you would describe in the brief? (the block diagrams might be useful here). What are some avenues for weight reduction you will propose?**

Reasons to fund the proposal:

* A lighter prosthetic hand could reduce the amount of Sensory Feedback that factors into the Controls, giving more attention (and processing power) the user’s actual Intent instead of trying to keep a heavier hand in the desired position.
* A lighter hand could move faster, more like a normal human hand, which would help any Arm Feedback feel more natural an intuitive than a slower, heavier robotic hand.
* Reducing the existing weight of the hand may leave physical space and weight to explore new capabilities or improved implementations.
* By establishing a lower weight as a Critical Need, a new Assessment and system development cycle would be kicked off, which would offer additional need to innovate and change the existing design instead of remaining bottlenecked to it.

Avenues for Weight Reduction:

* Change in material to something lighter – perhaps wood or something nonmetal, like a lightweight plastic or carbon fiber.
* Minimize dead space; embed necessary hardware like actuators and sensors into the structure as much as possible.
* Moving as much supporting hardware (circuitry, actuators, etc.) away from the hand and up into the arm or elsewhere on the patient, to reduce the load at the very end of the prosthetic (leverage works against a heavy hand in this case).
* Explore the Capabilities that the hand currently provides, determine their value in a well-defined and maximally objective manner, compare that value to the physical weight necessary to achieve it, and attempt to remove the capabilities that have minimal capability per amount of physical weight. While certain capabilities may be considered “essential”, there may be some that are handy or convenient but either unnecessary or achievable via simpler (if less advanced) means.