02. External Design Features

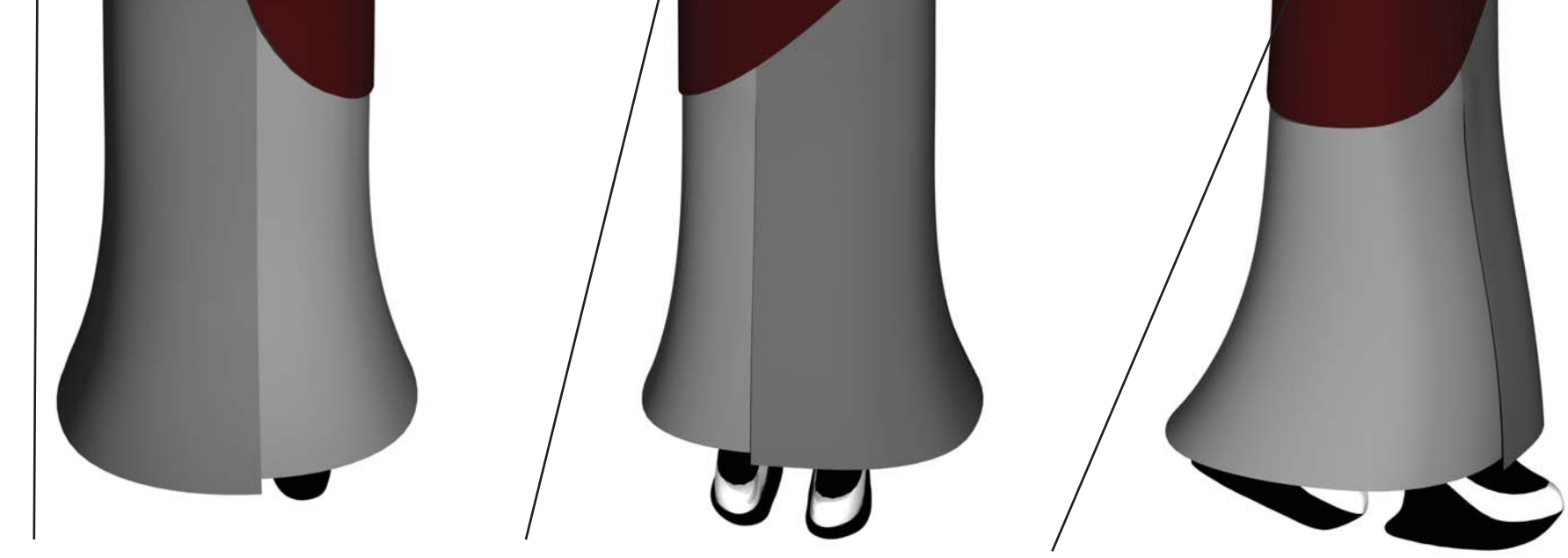
Objectives

1. Provide a protective housing for MIThril 2003 system and associated components
2. Allow room for modularity and flexibility in terms of hardware configurations
3. Be unobtrusive—the wearer's outward appearance is normal, no external electronics
4. Embedded electronics are specific to this garment: include sensors and actuators most useful for user's activities while wearing the coat
5. Embed a tag (RFID, or device which outputs a constant string) to tell MIThril what type of clothing is being worn, which systems are in it, and what the user's activity might be (which classifiers to load)
6. Inject a healthy dose of artistry and design into the wearables field

Outer shell is a padded microfiber to protect MIThril electronics and not appear bulky

Garment closes with 5 clasps in the front and 2 in the rear. Can be simple buttons or magnetic snaps

Main shell is a two-tone medium weight lambswool or cashmere: thin, elegant, and textured, but also protective



Removable cuffs can house added MIThril electronics and sensors

Media Lab branding is prominent but not overpowering. Lends stability to design iterations.

Main shell color can vary, providing "borg differentiation" like previous MIThril designs

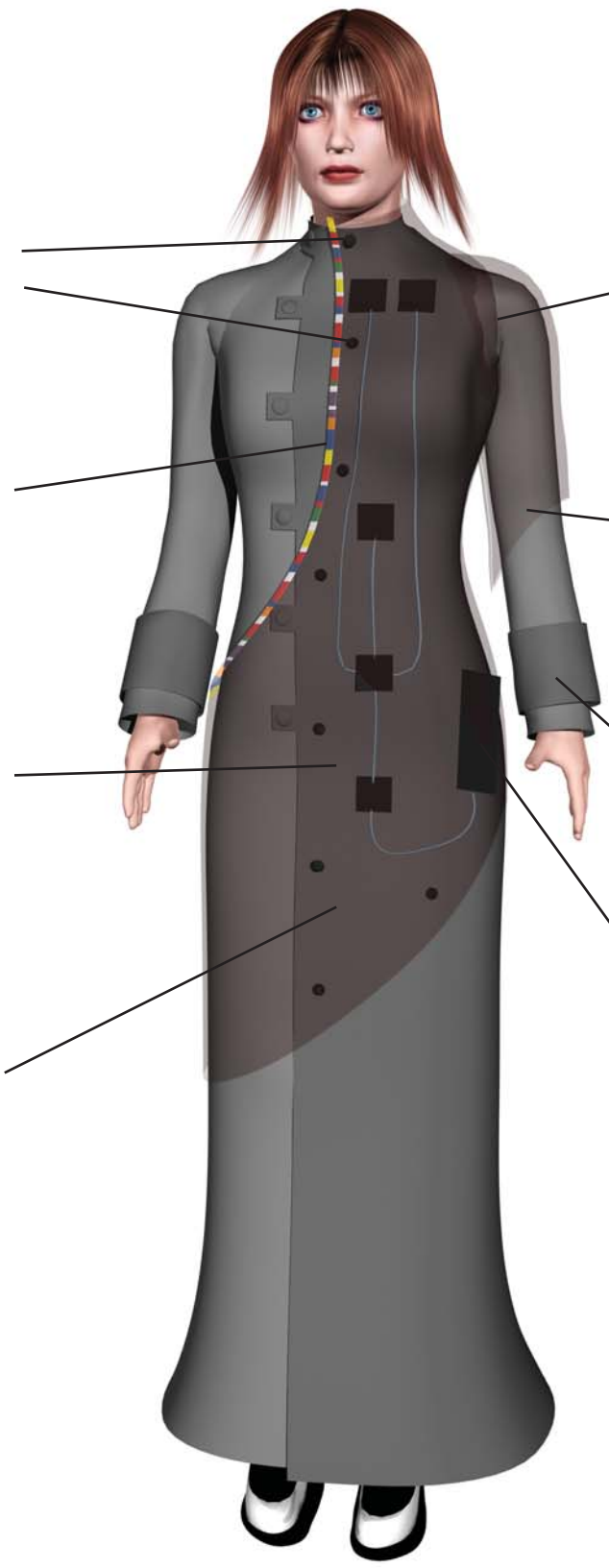
Design Motivation

1. Long coat looks sleek and modern—all electronics are safely and comfortably housed inside the removable outer shell
2. Fuses 1960's Courreges style with Oriental trimming for a modern, futuristic appeal and "wearables warrior" look — this is in the spirit of the Borglab
3. Mirrors sleek vision of contemporary designers such as Helmut Lang, Issey Miyake, and Emporio Armani
4. Can be adapted to a men's design by simply changing shape of outer shell, thus providing design continuity but not ignoring the stylistic differences between men's and women's outerwear

03. Internal Design Features

Hardware

1. Sensors and actuators: multiple accelerometers, internal and external temp sensors, bend sensors, heating elements, night illumination, IR/Bluetooth/WiFi transmit and receive
2. Embedded MIThril junction(s), wires to components, SAK2, biometrics, RF components, Zaurus
3. Battery Array for low-profile, rechargeable power
4. System recharges while on hanger with shoulder pad electrodes



Outer shell is fastened to inner shell with snaps, can be fully or partially removed to access electronics

Logo area can have customized LED/LCD segments for information display, can also embed microphones into outer shell

Velcro lining underneath outer shell can hold and position any MIThril component. Alternatively, a more advanced module inert/eject system can be developed

"Battery array" — grid of small rechargeable batteries distributed throughout garment, evening weight load and making power system invisible to wearer

Inner shoulder pads equipped with electrodes so system can be recharged while on a hanger in a rack: inconspicuous, efficient, and can be universally implemented

Can introduce bend sensors as a means of extending or creating classifiers

Accelerometer or biometric data collected from wrist cuff transmitted back to main system via nRF2401 wireless transceiver

Large fitted pocket for Zaurus includes more advanced docking system to minimize jostling and keep form factor slim

Extensions

1. Climate control: heating/cooling or shape changing elements
2. Flexible storage: size adjusting pockets, lockable
3. Information display: visual, tactile, and auditory feedback
4. Safety: protection from attackers, weather, smog, etc.
5. Fashion: enhancing artistic and cultural aspects of technology design

Future

1. Need a wide variety of "garment vehicles" for MIThril system, not just a coat
2. Athletic shirt: integrated electrochemical cooling, sophisticated biometrics, GPS, kinetic energy generation, etc.
3. Business suit: communications-oriented, cellular link, interface to desktop PC, etc.
4. Common ties: MIThril, Media Lab branding, forward-thinking fashion
5. MIThril 2003 still not ideal: too bulky, too many cables, not consumer friendly