

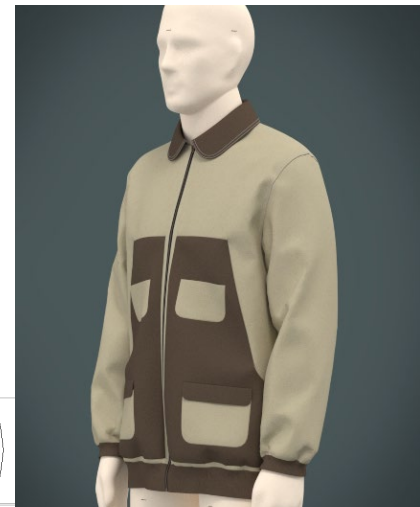
Atlas Coat: A Modified Chore Coat with Modular and Adaptive Features

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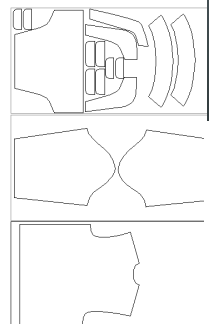
Keywords: Functional Clothing, Adaptive Apparel, Ready-to-Wear, Disability, Product Development

Mentor Statement: This adaptive jacket was developed as part of the student's senior-level capstone course and an independent study. The student conducted extensive user needs and market research, ideated the collection based on his chosen target market's needs, developed the CLO3D render, developed the technical package using Backbone PLM (product lifecycle management), and patterned, prototyped, and developed the final garment over two semesters. This ensemble is one of six garments in a larger project. The student was mentored on this project throughout all design and development stages, specifically ideation, 3D renderings, patternmaking, technical development, fitting, and developing the technical package. The mentor provided summative design critiques throughout the ideation process in their Capstone course. In the independent study, the mentor further advanced the student's learning about advanced garment construction techniques and how to use 3D visualization tools to create designs that meet consumer needs. The mentor selected this garment for submission based on the student's extensive user needs research and advanced prototyping technology application. This garment has understated sophistication regarding adaptive features built into the garment. This level of innovative design thinking that highlights adaptive considerations in a classically updated style should be shared with a broader academic audience. The resulting design exceeds the features and functionality of adaptive outerwear available on the market while holding true to a classic workwear style.

Statement of Purpose: The idea for this design came from a combination of wanting to develop a classic chore coat and a market gap for adaptive and inclusive apparel. The apparel market notoriously favors the able-bodied community (Garza, n.d.), providing minimal options for consumers with diverse needs and even fewer workwear options for this consumer. Given that every disability has varying requirements, it is impossible to create a functional design that can satisfy these needs (Fashion, 2023). For that reason, I chose a specific target market of men with autoimmune and neurological diseases that affect mobility and agility for this design. To analyze the requirements of this consumer base, I attended a panel with speakers in this marginalized group and gathered a myriad of information about their opinions on clothing and daily needs from apparel. In addition, I



Final CLO3D render after three sample iterations.



Laser cutting plan based on cut area of laser cutter.

consulted my father, who has Multiple Sclerosis, which affects his capabilities in donning and doffing and mobility in specific garments. The most common issue this consumer had was trouble using intricate closures, temperature regulation, and accessing pockets for storage on garments. Trims like buttons, certain zippers, and various other trims were burdensome to this consumer. In addition, tighter fit clothing and tight pockets were also difficult because of a lack of mobility and pain from mobility in my consumer's hands. Another common difficulty for this target market can be body temperature regulation.

Aesthetic Properties and Functional Design Features: For the visual design of this jacket, I chose to take a timeless style in a chore coat and add some modernity to the design. The block pattern of a chore coat remains unchanged, excluding an alteration to a common collar, rounding the edges, and widening the points. The modern aspects of this design feature include additions of sweeping panels attached to the front and back that double as easy-to-use pockets, the addition of a removable interior vest. In addition, I used color blocking to elevate the palette of the garment. This garment's functional features were a large part in this development, due to my consumer base's needs. To start, the implementation of a closure that is easy to operate was one of the largest needs. I addressed this need by using a MagZip magnetic zipper that eases the use of a zipper immensely. In addition, the front and back panel pockets have larger openings to assist with grabbing and putting objects into the pockets. I also developed a removable insulating vest to help with temperature regulation for my consumer, as one of the common difficulties for this target market can be the regulation of bodily temperature. The vest closes using Morito Snap Tape, a more dexterous solution to traditional buttons. The boxy fit of the Atlas coat can also be seen as beneficial for the mobility of my consumer, minimizing restriction.

Process and Execution: Although the garment may not look extremely technical and/or advanced, all the processes used in the construction of the garment were modernized. For the initial design, I created the garment in CLO3D and I checked the fit virtually on an Alvanon Men's ASTM Regular Size 38. Once the garment had a good fit in CLO3D, I exported the patterns to Adobe Illustrator and prepared the cut files for laser cutting. After the fabric was laser cut, construction started. All the components were assembled using industrial sewing techniques. I developed three samples of the jacket to perfect the fit and pocket placements. I fit each sample on an Alvanon ASTM Men's Size 38 dress form. After each fitting, I modified the virtual patterns in CLO3D and re-exported the file for laser cutting. This resulted in also having the 3D virtual model updated during the



Interior insulation vest using Morito Snap Tape closure.

design process. Further, I recorded fitting notes and fit changes in the Backbone PLM technical packages.

Contributions: The Atlas coat was designed to fill a market gap for adaptive and inclusive apparel, specifically targeting men with autoimmune and/or neurological diseases that affect mobility and dexterity. The Atlas coat features aesthetic properties and functional design features, including a magnetic zipper, larger pocket openings, a modular vest and hood for temperature regulation, and a boxy fit for mobility. Despite not appearing extremely technical, the making of this garment involved modern processes such as 3D design, laser cutting, and ultrasonic welding. The Atlas coat serves as a functional solution for a marginalized market.

References

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