Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## Success Story

# CAESAR REVOLUTIONIZES PRODUCT DESIGN AND MANUFACTURING

CAESAR™

3-D Anthropometric Database

The Human Effectiveness Directorate's Civilian American and European Surface Anthropometry Resource (CAESAR) provides accurate three-dimensional (3-D) human models and body measurement data for the improved design of systems, equipment, and clothing for warfighters as well as civilians.

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## Accomplishment

CAESAR uses 3-D scanning to remove the guesswork in human physical measurements. Since humans are 3-D, as are the products they use and wear, 3-D is vital in design. Traditionally, researchers used one-dimensional (1-D) body measurements, such as chest circumference, waist circumference, and arm length, to create 3-D human models; no other way existed to create the whole person in 3-D.

CAESAR's 3-D scans provide the complete 3-D person. It provides over 13,000 3-D electronic human models as well as 99 traditional, 1-D body measurements. More accurate 3-D models can save time and money formerly spent to make 3-D models from 1-D data.

With the capability to improve product designs, CAESAR allows researchers to design and tailor systems and equipment in order to accommodate different body shapes and sizes. Industry could use CAESAR as an effective, efficient way to design and manufacture products, such as automobiles, airplane seats, furniture, sports equipment, clothing, or artificial limbs, that better fit the variability of body shapes and sizes.

## Background

CAESAR, a 10-year effort within the directorate's Crew System Interface Division, is the technological brainchild of Ms. Kathleen Robinette, AFRL anthropologist and director of the Computerized Anthropometric Research and Design (CARD) Laboratory. Ms. Robinette recently earned the Good Housekeeping Award for Women in Government for her work with CAESAR.

Technologies pioneered in CARD, such as the first human head scanner and a whole-body scanner, helped launch CAESAR as the first successful 3-D surface anthropometry survey. The survey obtained body measurements of 4,431 civilians, 18 to 65 years old, from the United States, The Netherlands, and Italy—countries whose populations are among the largest, tallest, and shortest in the North Atlantic Treaty Organization, respectively.

Human Effectiveness
Support to the Warfighter

## Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-HE-15)