Wearable computer is a computer that is subsumed into the personal space of the user.

Extension of body and mind equipped with sensors-measure heart rate, foot step rate..

Embedded with non-transparent clothing.

Salient aspect- reconfigurability and generality.
ELECTRONIC FABRICS

• Wash-and-wear clothing fabrics that have electronics components and interconnections woven into them
• Data and power distribution as well as sensing circuitry are incorporated directly
• Use conductive threads to weave switches, circuits, and sensors into the fabric.
• These threads can be made from very finely drawn conductive metals, metallic-coated or metal-wrapped yarns, or conductive polymers.
SILK ORGANZA

- It is made with two fibres that make it conductive to electricity.
- The first fibre is an ordinary silk thread; running in the opposite direction of the fibre silk thread that is wrapped in a thin copper foil.
- A strip of the fabric would basically function like a ribbon of cable.
- Insulating material are used to coat or support the fabric.
- Components are directly sewn to the fabric. Other electronic devices can be snapped into the fabric by using some kind of gripper snaps, which pierce the yarn to create an electrical contact.
• Italian-made fabric
• Contains colour light emitting diodes (LEDs), has been used to make a glow-in dress
• Luminex is made by binding LED fibres into the ends of ordinary fabric, which then form the seams of tailor made clothing
• The fibres are powered by tiny, rechargeable batteries that are turned on by the wearer via a hidden switch
PLASTIC OPTICAL FIBRES
• Developed by researchers at Georgia Tech
• These optical and electrical conductive fibres are woven into the fabric
• This will allow the wear comp to wirelessly communicate with the other devices, transferring data from the sensors embedded in it.

SENSORNET
• The fabric is developed with support from the US military
• Designed to detect noise using an acoustic beamformer
• Capable of picking up and pinpointing the location of an approaching vehicle

CONTEXT-AWARE SHIRT
• Used for the blind, woven with tiny vibrating motors to provide warnings about approaching objects.
• For workers in the chemical industry could wear overalls capable of detecting a nearby spillage
• Sports monitoring
• Wearable health monitoring
• At home wealth monitoring
• Intelligent monitoring CPS
COMPONENTS

• Privacy
• Sensors
• Gateway
• Sensor fusion & network
MILITARY & MEDICAL APPLICATIONS
MEDICAL APPLICATIONS

- Data processing
- Patient monitoring
- Digital imaging
- Remote guidance
University of Washington - 2001

• Increased time focused on patients (48%)

• Decreased time spent on tasks (29%)

• Decreased amount of time looking at monitor (89%)
MILITARY APPLICATIONS

• Rugged (water, dust, drop resistant), high-resolution, daylight/nighttime readable

• Command
• Controllability
• Force multiplier
Air Warrior Communications System in attack helicopters

Stryker Light Armored Vehicle
ENTERTAINMENT & CLOTHING
• Smart Clothing" is made from fabrics that are wireless and washable that integrate computing fibers and materials into the integrity of the fabrics
• Burton Amp jacket - snowboarding company Burton in collaboration with Apple, which allows riders to blast their favorite music while simultaneously racing down the slopes.
This Gap Jacket has a control keypad located on the sleeve and a hood that conceals the speakers, which are removable.
CLOTHING FOR HEALTH

• Monitoring system
  - can warn patients with underlying health problems.
  - can be built into common items of clothing like bras, shorts or waist belts.
- BodyPad
  - group of wearable sensors
  - turn a person's arms and legs into a joystick for PlayStation 2 or Xbox fighting games.
The device measures the wearer's energy expenditure and body mass, then uploads data to a system that also estimates the amount of calories the person has consumed.
SMART SHOES

• The shoes records the amount of exercise a child does and converts it into television watching time
UNDER WATER WEARABLES

- Miniature personal computer
- Mask-mounted virtual display
  - presented a high contrast display
- One-handed controller
- Diver can access and record information with one hand - even while swimming
ADVANTAGES

1. Portability.
2. Hands-free use.
3. Comfortable.
4. Always on for the task it is designed.
5. Quick to access.
6. Fashionable.
7. Functions of clothing will be very personal.
8. The reuse of clothes will be important (prolonged life cycle).
DISADVANTAGES

1. Equipment can be heavy.
2. Expensive.
3. Some Wearable Computers can consist of a lot of wiring.
5. Side-Effects such as Headaches.
6. It may become easier to get data on an individual if the item is lost / stolen.
Conclusion

- Smart clothing is a combination of electronics and clothing textiles.
- Worn like ordinary clothing.
- Continuous physiological-monitoring to individuals.
- Some of the wearable designs remain concept prototypes on display only at cyber-fashion shows; others are already, or will soon be, on sale.
- Integrate a vast array of sensors into everyday products.
- Falling prices and rapid advancement
THANK YOU