

Smart Textiles in Health and Medical Applications

context

1st CONFERENCE

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Cost Action
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Smart Textiles for Health and Medical Applications

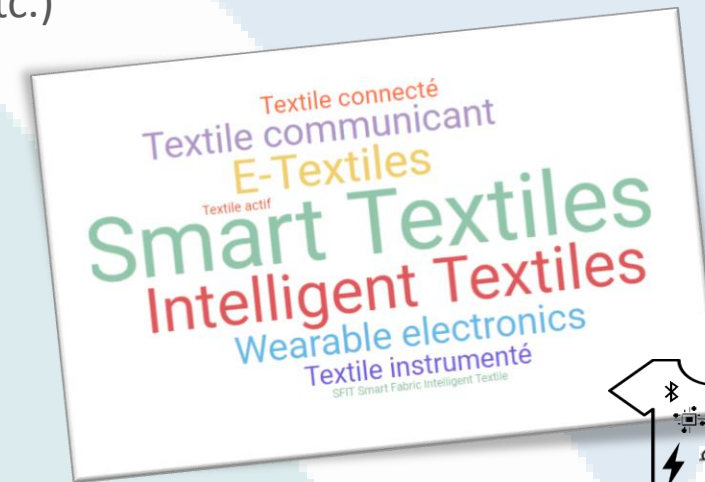
Textiles

- **Textiles** are a part of our daily life.
- Their first functions were to **protect** “Man” against bad weather, before aesthetics came to play an important role in dressing.
- Now, textiles are liked for their technical performances.
- They also become **smarter** and **interactive**.

Smart Textiles

• Smart Textiles

- **Sense, react** and **adapt** to different environmental stimuli (thermal, mechanical, chemical, electrical stimuli...) in a predictable and useful way.
- 3 categories of smart textiles exist, referencing to those 3 functionalities:
 - **Passive** smart textiles (anti-microbial, electromagnetic shielding etc.)
 - **Active** smart textiles (heating textiles, luminous textiles etc.)
 - **Very smart** textiles (wearables with sensors etc.)



Smart Textiles in Different Fields



Healthcare & Medicine



Sport



Transport



Protection



Building

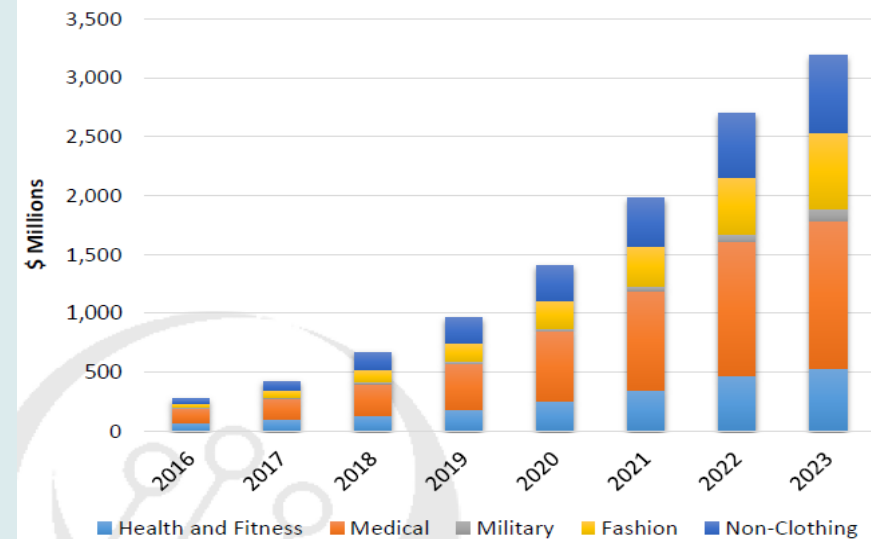


Fashion

- Smart textiles are used in many fields
- The **medical** application is a **key to success** for smart textiles

“Real Need”

Market Forecasts for Materials and Sensors in Smart Textiles by Application, 2016-2023



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Smart textiles for health-care & medicine use



Healthcare &
Medicine

“Real Need”

- The global aging of the population
- The increase in life expectancy,
- Concerns about the rise of obesity, chronic diseases

“has resulted in [increasing attention to health](#)”.

Smart Textiles in Healthcare & Medicine



Healthcare &
Medicine

- The **medical application of smart textile** is difficult to develop because of the complexity of the healthcare industry.
 - lengthy and expensive authorization processes
 - the impact of the exchange of medical data raises an ethical problem
- In 2014, the medical application represented 18,5 % of market shares, in 2023 will represent 60.03%*.

Smart Textiles in Healthcare & Medicine

- The stakes for tomorrow: **monitoring** and **home support**
 - to decrease the hospitalization time,
 - to keep elderly people at home for the longest time (grow old at home)
- The long-term goal of **textile sensors** for medical use includes :
 - early diagnosis,
 - disease prevention,
 - and treatment.

live better
be healthier
more independent
lower the cost of healthcare

Examples of products, and functions of use

Prevention & diagnostic

Smart textiles may be used for :
ECG, respiratory frequency, skin temperature, movement, blood pressure etc.

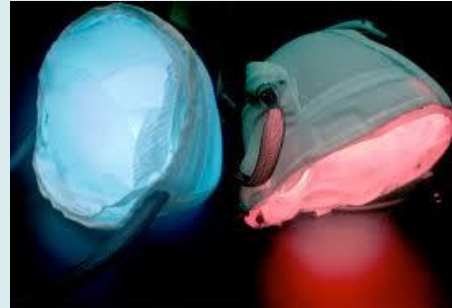


Bioserenity

Somnonaute project :
wearable for sleep disorders,
measure biological monitoring

Treatment

Smart textiles may be used for :
Light therapy, drug delivery,
prosthesis, etc.



Phos Istos

Phos-Istos project :
light emitting textile for the
treatment of precancerous skin
orders

Home support

Smart textiles may be used for :
Falls, locating intruders, long-term
activity monitoring, emergency
reactions



Future shape, SensFloor

Sensfloor project :
a sensorial flooring able to detect the
presence and falls of individuals and
react accordingly.

Trends on textile materials in healthcare & medicine

- Smart textile materials
 - Conductive Fibers, Polymers (Electrically, Thermally, Etc.)
 - Light Emitting Fibers
 - Nanomaterials
 - Shape Memory Materials
 - Self Cleaning / Anti Bacterial Materials
 - Chromic And Phase Change Materials
 - Energy Harvest Materials

sensors
monitoring
healing
warning
treating

Contact

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