





**F + R**  
**Hugs**



**Designing Desire Wearable Computers**  
**Interaction Design Institute Ivrea 2002**

Project: **F+R**  
**Hugs**

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**Desire**

**Protection** for your **Body**

**Protection** for your **Feelings**

**Feel** the **Touch**

**Feel** the **Warmth**

**Feel** the **Body Life**

**Feel** the **Pleasure**

**Feel** the **Hug**

**Francesca+Rikako**

**Hugs**

**Researching on people feelings and how much important a simple hug could be...**



## Design Concept

Wearing someone's...

Hug

Voice

Body Heat

Heart Beat

All the time

Clothes that protect not only your body but also your heart

The question we want to answer is:  
Is possible to share realtime emotions both in a mental and physical way?

We focus on the **physical** sharing because it allows you to really feel the closeness of a distant one that you love and miss when you are alone somewhere.

F + R  
Hugs

## Why Hug?

Psychological effect of hugging and other senses...

### Hearing

Rich in feeling & emotion. Sound of a loved one's voice can be enough to create feelings of comfort & **joy**.

### Seeing

Seeing is believing. Human face & body communicate a lot of meaning and emotion.

### Touching

Humans need physical contact with each other.

Infant sink into depression & **die without** it.

Adults deprived of tactile contact for long period will tell you just how depriving it feels.

A hug, handshake, a pat on the back, and a kiss are all important.

### Smelling & Tasting

Scent of perfume, hair, clothes and skin smell brings us very **close** to others.

Smelling stirs up powerful **emotional** reactions.

Smell & Taste are primary ways an infant connects to its mother



## Type of hugging...

Greetings

Friendship

Sharing **happiness**

Parental **love**

Condolatory

Cherish

**Love**

Often traditional holdings are better than the brand-new ones.

That's because you are more **familiar** with them.

In order to apply new holdings, you need **practice**.

We involved several users in **participatory** design of the **experience** of hugging, interviewing them and let them experience the prototypes.



**F + R**  
**Hugs**



## Few questions about Hugs

Interviews about emotional and physiological reactions to Hugs

What do you expect from a **Hug**?

What do you **feel** when you Hug someone?

What do you **think** this someone feels when **he or she** Hugs you?

When do you **need** a Hug?

Which kind of Hug do you **prefer**?

Where do you **put** your **hands** when you Hug someone?

What do you think happens to your body **inside** or outside during a Hug?

Who do you usually Hug?

How was your **longest Hug ever**?

Would you **like** to say something else about Hugs?



# F + R Hugs



## What do you expect from a hug?

The other person doesn't **smell** bad (Oscar)

Could be very very **warm**, almost **hot** (Simona)

Commitment to the **whole hug** going all the way through it (Dianna)

Warmth, a warm fuzzy **feeling** (Dianna)

**I expect** to hug person back, and be able to hug and smell and touch, feel the person, for me it's not that than being hugged is important but other that I can hug back (Natasha)

**I want** to feel a **real** hug, not a formal one (Mario)

Warmth, radiation of **live energy** (Stijin)

**I don't** expect anything from a hug because when I'm hugging I just interested in giving whatever like in (Deepak)

**A lovely** feeling (Bill)

**Make me feel happy, safe, loved**, at least. It is like alone for second like a **private** moment (Livia)

Full body **contact** (Sock puppet)

Strength, warm, **avvolgente** (Laura)

Pleasure, **passion**, warmth, the sensation of **being precious** for someone (Francesca)

# F + R Hugs



## What do you feel when you hug someone?

Happy (Oscar)

Strength? I have to **communicate** something that suddenly urged me.

**Unstressed**, calmer, happy, **accepted** (Dianna)

Physical **closeness**, I feel very close and that I can feel skin of the person (Natasha)

Heat, warmth and **softness** of the body (Mario)

Depends on person. If I hug Deepak, it's all right... (Stijin)

There are too many feelings. It gives a very content feeling, sense of **security** and it makes you **feel wanted** (Deepak)

I have better feelings when I hug my old friends when I meet them after 2 or 4 years, we do each other and **laugh** around a bit (Rajesh)

Makes me realize that someone likes me (Shyama)

Depends on person. But usually, lovely feeling (Bill)

Happy and **warm**, I love to hug (Livia)

I feel **close**, **intimacy** and **pleasure** (Laura)

If I hug a **friend** I feel very happy and I am trying to communicate to this someone to let that person feel comforted in a way.

If I hug someone that I **love**, I want this person to feel how much he is **important** for me (Francesca)



# F + R Hugs

## Usually whom do you hug?

Men, close **girlfriends**. In Portugal, you give **two kisses** and hug any of your friends, so it's normal for us to hug but it's not like very strong hug (Natasha)

My girlfriend (Stijin)

I hug Natasha three times a day (Rajesh)

Normally I don't go hugging myself but I accept hugs (Shyama)

**Karen, my wife**, my friends. I got used to hugging a lots of people including other guys. Because that is normal in California (Bill)

I hug a lot of my girlfriends and everyone in my family (Livia)

My friends, my **mom**, boyfriends, and I used to hug my **grand father** a lot (Francesca)

## How was your longest hug ever?

I don't think I have done anything that demands too many hours unless you think of **sleeping** together as being a hug. But I don't think that is really a hug. That's **more** of it (Bill)

Must be very **long**. Sometimes, you hug when you are **sleeping** (Livia)

Longest hug was maybe when something very strange thing happened to me either something very beautiful or something very bad (Laura)

When I **sleep** with someone, I love to put my arm around him, we slept almost 8 hours like that. (Francesca)

# F + R Hugs



## Which kind of hug do you prefer?

Good one, **strong** one, around my **waist** here (Natasha)

A hug **beating** on the back (Mario)

Total confronting full-body hugs. A hug on the back of my girlfriend when she is doing something. A normal hugging but more contact (Stijin)

A **full body** hug. I don't like a soft hug (Rajesh)

A hug completely **tight** (Syama)

One that I get from Karen every time I see her (Bill)

Should be like **strong** and long hug. Shouldn't be too fast (Livia)

It depends on the person's height (Livia)

When someone hugs me, I love to be kept around my back or waist **strongly**. I like to feel someone's hands on the back of my neck (Francesca)

## Where do you usually put your hands?

Right around one's **shoulders** (Bill)

Put **arms** and **hands** on one's back. When I hug Magnus, I just hug his stomach (Livia)

Depend on height of person. Around someone's **waist** or shoulders (Laura)

Around someone's **waist**, neck (Francesca)

# F + R Hugs



## What do you think happens inside and outside of your body during you hug someone?

Maybe some harmonious stuff about these **hormons** which makes you feel erotic, which gives you **comfort** in a direct trigger way. Those are enough there that affects everybody in sense of way, just some extent, so probably it is just a **basic physiological phenomena**. (Bill)

I get all this **positive** chemical things going on. I get relaxed and happy and **feel good**. (Livia)

My muscles are relaxing. Endorphin. I have a sensation of **warmth** especially if outside is cold. (Laura)

There is something like a **chemical reaction**, a lot of hormones going around my body. I feel euphoric, happy and special pleasure that make each part of your body become **hot** at the same time. I also feel something like **waves going up and down**. (Francesca)

## When do you need a hug?

Almost **all the time**. It's kicking my life going **any time** (Bill)

I need hugs in the morning. Also when I am tired, **sad or stressed**. (Livia)

Often. For **reassurances** (Sock puppet)

**Always**. But specially, when I am sad (Laura)

When I am stressed. Hugging someone is like putting all my stresses down **to the ground** (Francesca)



# F + R Hugs



## What do you think someone feel when he or she hugs you?

I don't know (Simona)

I hope I am hugging them in the way that **someone feels the same way** that I do (Dianna)

I hope the person feel some affection in a **very good way** (Stijin)

I make the person feel **absolutely at home** and I know it (Deepak)

Must be **feeling nice**. I am a nice guy (Rajesh)

I guess, they are **very instantaneously** expressed (Shyama)

Warmth of embrace, cosiness, **security, comfort**, and pleasure (Bill)

I want someone to feel warm, **loved and safe** and **closeness** (Livia)

**Necessary** just from the front, also I like to try to hug behind (Nat)

**I think words don't fit to describe hugging** (Stijin)

# F + R Hugs



Do you want to say something else about hugs?

**Hug is good for you.** Please hug people. (Oscar)

It depends on the height of the person. If somebody might higher or shorter, probably. I feel more comfortable that I like around shoulders. If the men is taller than me, there are two kinds of hugs, either his **arms** are around my shoulders and I am around his like that. It's completely different if he is taller than me and I have my own **shoulders** on his shoulders. **I like** both, equally (Dianna)

I sometimes particularly in public and if I don't know someone very well, I feel awkward about hug or I don't really want to hug at the moment.

But normally if somebody I feel comfortable with it, doesn't matter if it is public or **private** (Dianna)

Strong **physical contact**. Have to consider more about persons attitude who are not used to hug other people (Mario)

A hug from a very good friend it is like a **real** nice bear?? hug (Deepak)

**Please hug me** (Rajesh)

Hugs are a part of making you feel **comfortable** (Shyama)

It is a wonderful way of getting to know someone. When you hug them, **you can see the heart** of person that you've never seen before (Livia)

**Yes, please** (Bill)

# F + R Hugs



## Understanding Hugs Keywords

### Emotional

Feel Real Live Energy

Lovely Happy Safety

~~Pleasure~~ Passion Unstressed

Accepted **Closeness** Softness Wanted Take Care

Someone Likes me!

**Lovers Friends Mom**

**You See the Heart**

### Physiological

Warm Hot

Harmonious Relax Endorphin **Positive Chemical Things**

Hormones going around

**Euphoric** Waves

### Body parts involved

Arms

Beating on the Back

Full Body

**Waist Neck** Shoulders Stomach

Behind Front





## Research on previous wearables

### Available Technologies

#### WEARABLE MOTHER BOARD (Georgia Tech)

Possible to locate a bullet wound.

Possible to transmit **vital signs** to an attached device.

#### SMART SHIRTS (Sensatex Inc.)

Sensors integrated into a **T-shirts** or a vest.

Possible to sense heart rate, **body temperature**, **respiration rate**.

#### LIFE SHIRT (Vivo Metrics Inc.)

**Lightweight** cotton lycra vest about 6-10 ounces + embedded sensors

Possible to **time-stamp** all recorded data

## Experimental research on Wearables

#### HUG VEST (MIT Boston.)

Student thesis project, no data on the net, but seems to work?

#### MOTOROLA

Gathering data accessories

Too much scenario based, low **usability**

#### PHILIPS

Wearable to perform, **work-out**, enjoy, connect, embody

for professional business people

sportswear

playsuits for kids

**streetwear** for youth

enhanced **bodycare and adornment**

# F + R Hugs



## Research on materials, fabrics, shapes

### Materials

Soft and **elastic material** that naturally fits one's skin, **Lycra** by Dupont

Fluffy material that makes people feel like cuddle, positions of **human body** where are **sensitive** to subtle warmth and pressure

### Kind of clothes

**Underwear**, evening gowns

**Sporty**, streetwear look or **evening embroidered** haute couture looking

### Kind of look

Embracing clothes, **glamorous** patterns inspired by Japanese Obi belt or Renaissance hard corset.

Cool materials and **wearability of extreme sports** clothes, **easy to wash**, **lightweight** is a must, the sensation of wearing must be left aside, you wear something beautiful but so comfortable **you can't notice you're wearing it**.

### Kind of sensors involved

**Heart Beat**: rate detectors

**Termistors**:

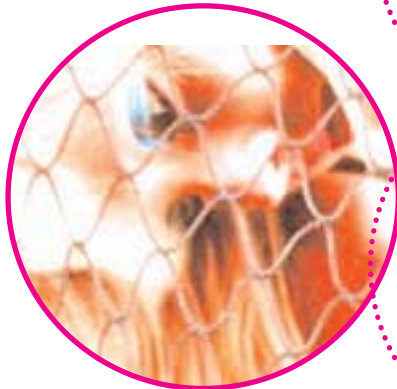
**ElectroLuminescent Paper**

**Heating Pads**

Microscillating Pump (**inflate/shrinks**) automatically (medical devices)

New composition for **gel chemical** principles (hot/cold/flat/inflate)

# F+R Hugs



## Designing F+R Hugs Ideas and sketches development diary

### 1st week

**Research** on wearables, defining the concept through brainstormings, sketches, immediate feeling on **hugs**

### 2nd week

Working on materials/fabrics research, defining the **interaction/communication** modes, **input/output** devices related tasks

### 3rd week

**Interviewing** possible users to define keywords about hugs, and **positioning** of the hugs on the body, physical and emotional reactions studies, **testing prototypes**

### 4th week

Studying the context of use, **target users**, **scenario** building, looking for the right sensors designing flow-charts of **electronic** tasks, building the working **prototype**

### 5th week

Final prototype ready, defining **advantages**, business **opportunities** and ways to technologically **implement** the project as **future step**.



# F+R Hugs Diary

## Context of use and business opportunities

off-site couples

doctor & clinical patients

show business (movie stars and their fans)

sports business (spectator sports market, outdoor sports...)

geriatric and infant monitoring

night clubs & discos

workers in hazardous environment such as chemical spills

Sharing emotions concept

## Scenario

Kelly is at home in Paris (alone), her boyfriend Peter left for a meeting in Sweden. She decides to go out for some workout in the Jardins deLuxemburg and she wears the Sport Hugs underwear (just in case). While she is training in the park she runs a lot thinking at Peter so distant, she really misses his warm hug, so she decides to send an input to him: a tender soft hug. After few minutes finally Peter that already has received her hug since he was wearing too his Hugs underwear, at the end of the meeting could send her a hug back, he sends a lovely intense strong love hug, she could feel his heartbeat and breath and warmth is like having him there for real.

# F+R Hugs

# F+R Hugs Diary

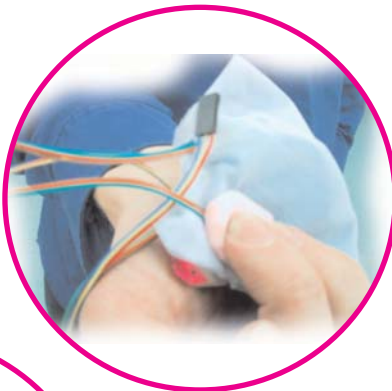
## 2nd week

Physical prototype



## 3rd week

Testing and bodystorming with prototype



F+R  
Hugs



**F + R**  
**Hugs**

## The prototype

**Protection** for your **Body**: padded sections in delicate body parts silicon+gel bags

**Protection** for your **Feelings**: now you **can feel**:

**Touch**

**Warmth**

**Heart Beat and Breath**

**Pleasure**

so Feel the **Hug**

## How the Hugs project works

The **Hugs** bodysuit that looks like a sporty cool **underwear** allocates in the **red circled** areas silicon bags containing the **output** devices connected between them thanks to the small wires channels (following the dark gray stitchings)

On the **wrist** is allocated the detachable **input/receiver** device, so the user could send the hug also without wearing the complete system but only carrying out the input/receiver.

The positioning of the **silicon bags** around the waist is ergonomically compatible and the positioning of the input device on the wrist makes possible to manipulate the system through **natural gestures**.

That makes the **Hugs System** completely modular, customizable and controllable by users.

# Hugs project description

## Hugs T-Shirt

Its a lilac Lycra T-shirt, with **silk screen** printed red circles and dark gray contrast stitchings.

Will be perfect to implement also the clothes aspect using **seamless** technology.

Under each **red circle** there is a pocket where could be allocated an **output bag/device**, the output device could also be used to **protect the body** during sport activities thanks to its **silicon soft bags**.

(see composition of output device next page)

Between each pocket there are connection channels for wires, wires must be thin and transparent.

In case of use of **UMTS** protocol wires will not be placed.

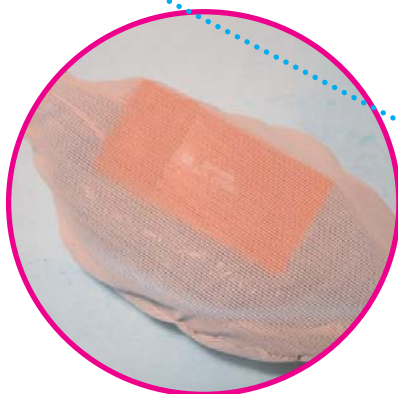
Pockets are placed on the **back, neck, arms, waist** and wrist, the pocket on the **wrist** will allocate the **input** device to send hugs.

(see composition of input device next page)

F + R  
Hugs



# F+R Hugs



## Input and output devices

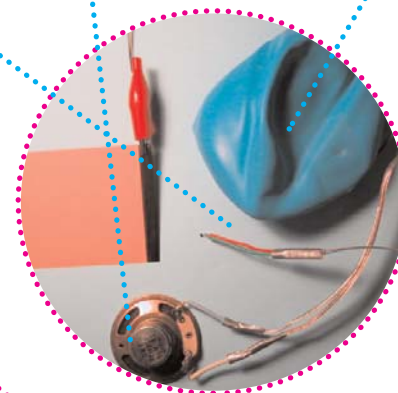
### Hugs input

The input device is composed by various sensors and its **task is to check and transmit** information to the output device.

The information to check are: body temperature, heart beat rate, hug strenght of the person that sends the hug.

the information to send are **heart beat rate**, breath, **temperature** and **pression**.

That info are detected by a **termistor**, a **stetoscope** and by a **pression sensor**, the system is working when the EL paper is lighting up.



### Hugs output

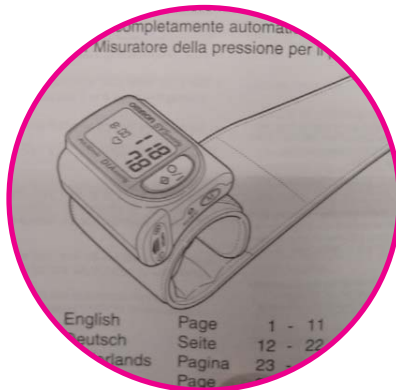
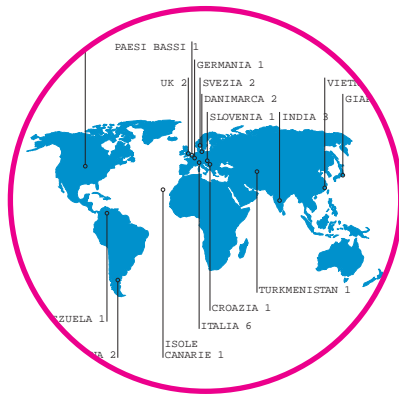
The output device is composed by a soft **silicon bag**, an **heating pad**, a **ballon** inflated/shrunked by a **microoscillating pump**, paper **speaker** and **EL paper** lighting since the fabric is semitransparent creates a pleasant pulsation effect sinchronized with the hb rate of the sender.

The output function is to receive the input information and **modify values** and physical aspect of the different electronic devices.

The heating pad receives the input to become **warm** as the body temperature of the sender, the speaker transmits the **sound of the heartbeat**, the **balloon inflates** an makes pressure **as the hand of the sender**, when the balloon shrinks you can really feel the **hug** going away.



# F+R Hugs



## The prototype

### Next steps to implement the project

#### Real Time Sharing

To fit the **Real Time Emotion Sharing** concept, our next step will focus on the application of a wireless technology using the **UMTS** protocol, so to have a device able to **send and receive** hugs without pushing buttons or activating sensor, to let the communication be more **natural** around the **world**.

#### Fit different users

To fit the needs of **different users** will be available several different **style versions** (fabric, decoration and so on) sport, evening, outfit etc.

#### Realistic sensation

To let the pressure sensation be **more real** we found out the right technology a **microoscillating pump**, electronically controlled that will give the **perfect hug strenght**.

To read also other tasks should be preferable to find more sensitive **sensors** and make some tests with **Muscle Wires**.

Or instead of having a pump will be interesting to reasearch a new kind of gel that inflates when is warm and shrinks when is cold....

We want also work on movement rechargeable batteries, on having a switch mode to let you decide when you want to be connected, and a **screening procedure** for upcoming hugs.

The slide features a white background with several circles. A large solid blue circle on the right contains the text 'F + R' and 'Hugs'. To its left are four smaller solid blue circles of varying sizes. There are also four dotted blue circles scattered around the slide: one at the top center, one at the bottom center, one on the right edge, and one on the left edge.

**F + R**  
**Hugs**