

Why do I shoot electric shocks on my body?

The Evolution of Alert & Notification System

ma.la

Becks Japan #1

Today's theme

- Evolution of notification interface

Notify with modern people

- Mail / LINE / Slack / etc
- Various contacts will come when we are working
- Modern people are suffering from notification

Our work and notification

- for security engineer?
- Emergency Contact / Something Hurry
- Server is down / Personal information is leaked
- More than usual notification **Strong** Notification required
- We need **further study** about notifications

Human body equipped sensor

- what is called the so-called five senses
- Visual
- Hearing
- Tactile sense
- Taste
- olfaction

Role of warning

- Notify of dangerous things
- Warning / artificial warning existing in nature
- Tactile sense, taste, smell
- thorns, bitter, smelly

Taste / olfaction is also used for notification

- Artificially processed warning
- Example: prevention of toys' misperception
- Example: Detection of gas leak (propane gas originally odorless)

Example

- Zelda licked, bitter



- <https://www.theverge.com/2017/3/1/14778316/nintendo-switch-cartridge-taste-test-dont-lick-it>

Programmable notification

- Computer controlled warning
- Light, sound and vibration are often used
- Programmable, easy to generate

Features required for recent notification / warning interfaces

- Be able to control amount of information and notification range
- Visual notification example
- Information volume is high / narrowly informed: Notification on smartphone screen
- Information amount is small / widely informed: Patlamp
- Large light and sound can be notified to irrelevant people

Strong notice at work

- Voice call / Face to face communication
- Consideration of USB / network patlamp
- High cost/Manufacturing stoppage → Self-made kit is available.

Ready-made item: USB / network warning light



- https://www.patlite.jp/nh_fv/nh_fv01.html

Crystal Signal Pi



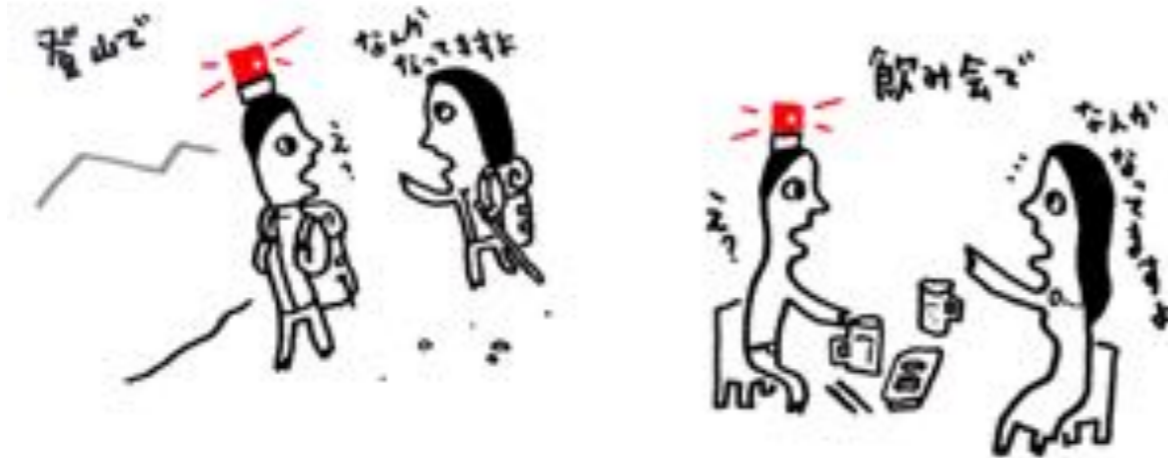
- <https://www.amazon.co.jp/dp/B06XW4C8YD>

Disadvantages of existing solutions

- Sound and light can emit a strong warning to a wide range
- But they are not always in the workplace
- **Portable** and **Strong** Warning device required

Examples of prior studies

- 2014: Make mobile phone lamp at Raspberry Pi
- <https://qiita.com/ie4/items/a4056d5abc8a7b0ce3c6>
- It is better for others to notice by equipping a patrump



- Hey **It is too conspicuous**

Which human sensor is advantageous for "strong" notice?

- Disadvantageous for detection of abnormality if you are using normally
- You need to notice even if you are doing another task
- Compatibility with multitasking: Use of sensor which we do not normally use is essential

Compatibility between notification and human body sensor

- Sight: Do not worry unless you are looking at the screen from everyday
- Hearing: difficult to control range / dangerous if it is headphones from everyday
- Example: Huge ringtone → troubles also to surrounding people
- Taste: I do not know the taste not actively put in the mouth
- olfaction: difficult to produce, bioterrorism

Notification and human body sensor

	Visual	Auditory	Tactile	Taste	Olfactory	memo
Passive detection	△	○	○	×	○	compatibility with multitasking
Ease of generation	○	○	○	△	△	Programmable?
Ability to diffuse	○	△	×	×	○	widely informed
Ability to not diffuse	○	△	○	○	×	Can notify only to myself

Best Answer: Tactile

- It is inevitable that **tactile** remains in the notification means addressed to individuals
- invention of manner mode / vibration
- Send notification only to that person without emitting sound or light
- Tactile has been personalized from the beginning

How do I send a strong tactile notice?

- There are no remedies that can only satisfy the requirement "tactile"
- If it is "tactile", no matter how strong it is to individuals
- But **Vibration** can only send weak notifications

Answer

- Electricity is passed through the body

Examples of prior studies

- 2015: Human body, electricity and notification by @mackee_w
- https://techblog.kayac.com/tech_kayac_adventcalendar_2015_20.html
- Control of the switch of the EMS machine (muscle tray) over the network
- Respond to internal chat (IRC / Slack) posts
- Use servomotor for physical switch control

From tactile to pain

- Increase the strength of tactile sense will become pain sensation
- Can you make notification by "**pain sensation**" more easily?
- There is such a convenient device → **I found it!**

Pavlok Shock Clock



- Available at <https://pavlok.com/> Japanese distributor / Amazon etc.
- <https://www.amazon.co.jp/dp/B07CXKLN6W>

Introduction of Pavlok Shock Clock

- Overview: Alarm clock that allows electricity to flow through the human body
- Mechanism: Notify to smartphone → Bluetooth cooperation → electricity to human body
- Control over the network
- Equipped with hacker preference features such as IFTTT interlocking

Pavlok reminds us of important things

Pavlok is a new generation smart watch

- I do not know the time → What happened to it? I can understand it with a smartphone
- Why are devices on arms even though there is a smartphone?
- To provide functions that can not be realized with smartphones.

The world is full of advertisements of lies

- Comparing numbers and catalogs easily deceive users
- For example, CPU is fast / memory is large / battery capacity is large
- What is important is **What can be done?**
- What **value** can you offer?

Apple vs Pavlok / Basic features

	Apple Watch	Pavlok Clock
Clock	○	×
Music playback	○	×
Image display	○	×
GPS / Directions	○	×
Health care	○	×
Apple Pay	○	×
Waterproof performance	○	×
Notification by sound	○	○
Notification by vibration	○	○
TOTAL SCORE	9/9	2/9

Apple vs Pavlok / Advanced features

	Apple Watch	Pavlok Clock
Notification by shock	×	○
Can pass a weak shock	×	○
Strong shock	×	○
Voltage adjustment (10% to 100%)	×	○
Manual shock	×	○
shock remotely	×	○
Repeated shock	×	○
TOTAL SCORE	9/16	9/16
Price	¥ 45800	¥ 25800

Do you know?

- Only 25800 yen with performance equal or superior to Apple Watch

With Smartphone

- Smartphone can substitute missing functions
- The advantage of Apple Watch is almost lost (waterproofing)

	Apple Watch	Pavlok Clock	iOS / Android
Clock	○	×	○
Music playback	○	×	○
Image display	○	×	○
GPS / Directions	○	×	○
Health care	○	×	○
Notification by sound	○	○	○
Notification by vibration	○	○	○

Because it's an important thing again

- Only 25800 yen with performance equal or superior to Apple Watch

Pavlok vs EMS Machine

- Massage treatment machine or muscle training machine
- Devices that can be controlled with Bluetooth + application appeared



- <https://www2.elecom.co.jp/products/HCT-BTP01.html>

Hackable?

- API is not released → Hack's threshold seems high
- Gel sheet is not premised on wearing for 24 hours
- Consumes with each removal
- Battery exhaustion may occur due to muscle training and massage
- Pavlok can notify you only, easy to remove

Pavlok Practice Introduction

- Although it was released two years ago, basically YouTuber's toys
- Review finished (not used regularly)
- GIGAZINE review video
- <https://www.youtube.com/watch?v=kcl4sOIIHNE>

Pavlok for common people

- It is designed to be usable even if not an engineer
- Friend of Facebook has a function to send electric shock remotely
- **Any voltage** can be applied from **10% to 100%**
- It will be this if 100% voltage is applied ↓
- <https://www.youtube.com/watch?v=kcl4sOIIHNE>



Your Remote

Select a strength and stimulus and have it sent to your Pavlok.



Beep

Low

Medium

High



Vibrate

Low

Medium

High



Zap

Low

Medium

High

HTML source

```
</div>
<div class="row button-row">
  <div><div id="button-labels-left">Zap</div></div><hr class="righthr">
  <div class="col-sm-3"><a href="/mine/fjq[REDACTED]zF/zap/60"><button
id="pressy-button-low" class="btn btn-primary">Low</button></a></div>
  <div class="col-sm-3"><a href="/mine/fjqV[REDACTED]F/zap/160"><button
id="pressy-button-med" class="btn btn-primary">Medium</button></a></div>
  <div class="col-sm-3"><a href="/mine/fjq\ [REDACTED]F/zap/255"><button
id="pressy-button-high" class="btn btn-primary">High</button></a></div>
</div>
</div>
```

- URLs that are likely to flow electricity are written

Hacking for Pavlok

- Contents of Pavlok API: API server made by Heroku
- Vibration and electricity can flow with a simple HTTP GET request
- You can create your own client if you extract the ID that identifies the device
- Danger when exposing the ID of the device to another person as it is

1. Wrap API

- Normal notifications vibrate, important notices shoot electric shock
- Record the time of the last electric shock
- Do not let electric shocks flow continuously within 60 seconds

```
my $ last_shocked = 0;
my $ SHOCK_INTERVAL = 60;
...
if (! $ important || (time - $ last_shocked) <$ SHOCK_INTERVAL) {
  $ furl-> get ("https://pavlok-unlocked.herokuapp.com/public/do/##/vibrate/160?");
} else {
  $ last_shocked = time;
  $ furl-> get ("https://pavlok-unlocked.herokuapp.com/public/do/##/zap/50?alert_");
}
```

The completed dedicated web interface

mala shock

嘘偽りなく重要な連絡であると誓います

これは何

malaに電流を流します。なにか重要な用事があったときだけ使ってください。

イタズラが多かったら止めます。

2. Connect with Slack

- Slack client for terminal streams all participating channels
- <https://github.com/dayflower/slack-hidarishita>
- From the lower left part of LimeChat of IRC client

3. pick up keywords

- Filter the output of slack-hidarishita by pipe
- Simple logging / notification script written in perl
- `bundle exec ruby slack-hidarishita.rb | perl alertchan.pl`
- Call the API if the keyword is included in the remark
- Automatic reloading with notification definitions / updates written in JSON

Slack Notification definition file sample

- If statements include @mala → **Shock!!**
- LINE Bug Bounty When the program comes to the program → **Shock!!**
- If there is a problem keyword in service → *vibration*

```
{
  "mention": {
    "regexp": "@ mala | bugbounty-admin",
    "action": "shock"
  },
  "outage": {
    "regexp": "Fault | Emergency | Falling",
    "action": "vibration"
  }
}
```

Operate homebrew notification system

- Actually running from the summer of 2018
- Several electric shocks flow per day
- Voltage is adjusted to "slightly hurt" degree
- You will notice even if you are walking outside
- I do not notice it when I am sleeping

Looking back on the life with electric shock

- Reliable feeling that "important currents flow through the human body"
- Liberation from "Notification comes -> Watch smartphone"
- The notification itself to the smartphone is convenient and will continue to be used
- There is a limit to human processing ability, and it is necessary to ignore efficiently

Summary and Perspective

Pavlok recommended

- Pavlok as a practical device
- Tactile / electric blasts proved to work well as a notification means
- I think that it should be popular not only for myself but for many people

Supplement for just in case

- This is what I do without permission by my free will, it is not a business instruction or the like.
- No further strong punishment will be given by removing the belt.

Future Perspective

- Release of **highest voltage** according to importance
- Depending on the importance of bugs and obstacles
- If you do not notice, increase the voltage, etc.

Pavlok's bad place # 1

- Voltage is not stable
- skin becomes rough

Pavlok's bad place # 2

- I am wearing it on my arm but I do not even know the time
- Even if notification comes, information amount is small
- If you are awake you will notice extraordinary vibrations
- Is smartwatch actually handy? What?

Why do I shoot electric shocks on my body?

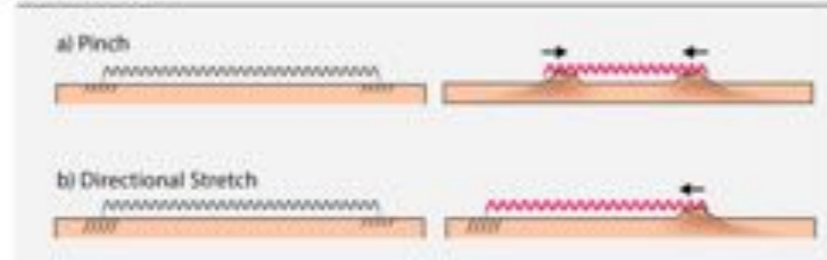
Smart glasses and bone conduction headphones

- Information transmission is possible without disturbing vision / hearing
- Miniaturization / weight saving of devices is progressing
- The burden of constantly wearing is decreasing

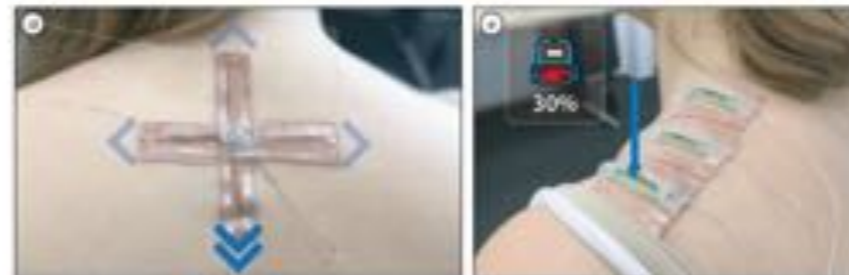
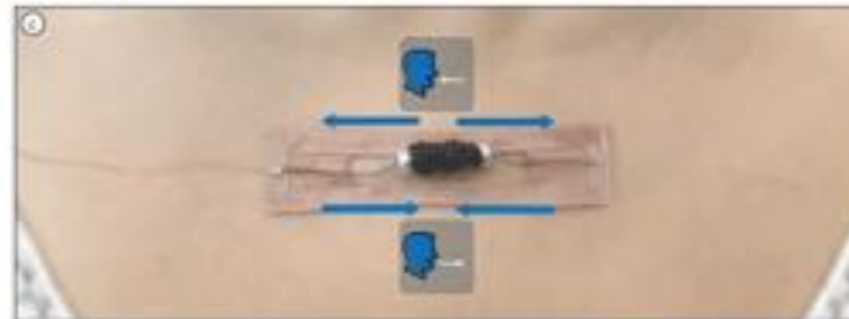
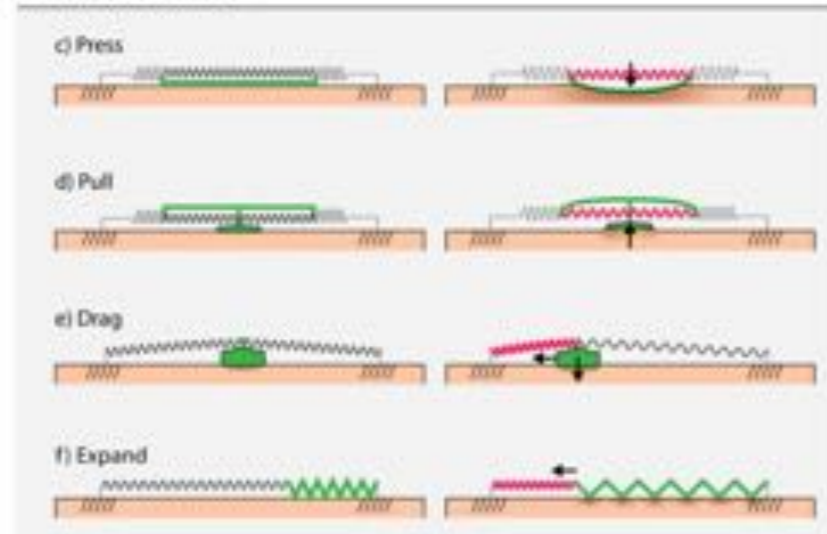
Research on haptic interface

- Tactile Generation with Shape Memory Alloy

Skin Actuators



End-Effector Actuators



- <https://shiropen.com/seamless/springlets>

Is there necessity of using pain sensation?

- There is no time zone concerning.
- It is not a good thing to be forcibly woken up while sleeping.
- Why bother to bother yourself?

Why do I shoot electric shocks on my body? # 1

- Recovery of physicality lost by the net
- too safe internet / dangerous real
- Painless information dissemination / sudden stabbing
- We are blocking pain sensation under the name of security and accelerating the loss of physicality

Why do I shoot electric shocks on my body? # 2

- Even the pain sensation necessary for "safety" has been blocked
- Elimination of criticism and disliked opinions / division in national units
- "Holes" are necessary to keep the world hackable
- Let's start from familiar place. First of all we are vulnerable to the human body.

That's all

- thank you for your attention