Dicotomix

M. Guy, E. Hazard, E. Kerinec, F. Lecuyer, P. Mangold,
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April 5, 2017

ENS DE LYON

Agence Régionale de Santé Île-de-France

Hospices Civils de Lyon

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Charcot disease and locked-in syndrome

- Almost entirely paralized
- Keeping all cognitive abilities

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Existing methods : EJASINT

Code “EJASINT” conseillé par ALIS

1	E	A	N	R	C	V
2	J	I	L	P	H	W
3	S	U	D	G	K	
4	T	M	B	Z		
5	O	F	X			
6	Q	Y				

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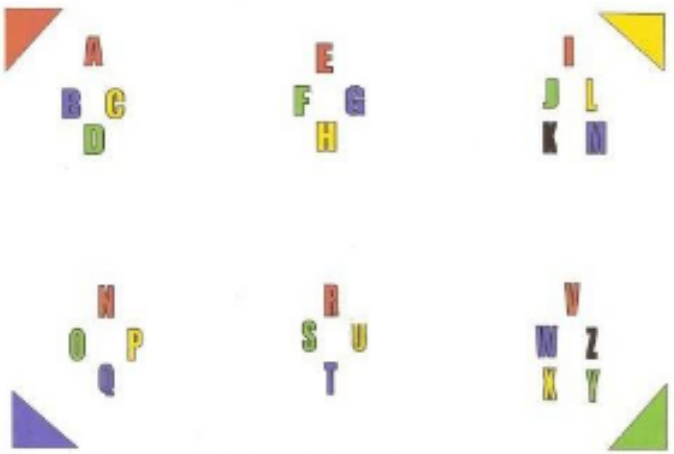

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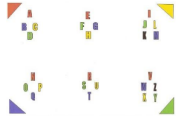
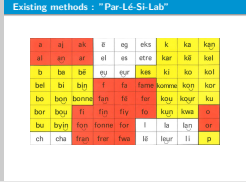


Existing methods : "Par-Lé-Si-Lab"

a	aj	ak	ē	eg	eks	k	ka	kan
al	an	ar	el	es	etre	kar	kē	kel
b	ba	bē	eu	eur	kes	ki	ko	kol
bel	bi	bin	f	fa	fame	komme	kon	kor
bo	bon	bonne	fan	fē	fer	kou	kour	ku
bor	bou	fi	fin	fiy	fo	kun	kwa	o
bu	byin	fon	fonne	for	l	la	lan	or
ch	cha	fran	frer	fwa	lē	leur	li	p



- bob
- alice

Concept

- Writing word by word rather than spelling (reduce frustration)
- Optimizing each question
- Making it intuitive thanks to a simple interface
- The only requirement is a binary input

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- Optimizing each question
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1. First, we thought about using something like "Akinator".
2. We've worked with designers.
3. Our software is indenpent of the binary input.

Demo

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Algorithm

- Dichotomy over a dictionary (right/left signals)
- Frequencies of words taken into account
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1. Explainations on the board !
2. This is espacially useful for error detection. We'll see later.

The proof that Dicotomix is fast !

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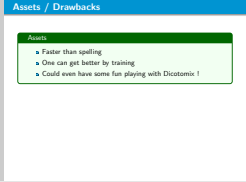
Assets / Drawbacks

Assets

- Faster than spelling
- One can get better by training
- Could even have some fun playing with Dicotomix !



1. We made a comparison between some existing methods and ours. This could also be proved theoretically.
2. This will be confirmed by the study.
3. The user is not as passive as in the methods described before.

Assets / Drawbacks

Assets

- Faster than spelling
- One can get better by training
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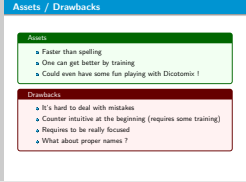
Drawbacks

- It's hard to deal with mistakes
- Counter intuitive at the beginning (requires some training)
- Requires to be really focused
- What about proper names ?



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How to deal with mistakes ?

- Cannot automatically correct mistakes

How to deal with mistakes ?
Cannot automatically correct mistakes

1. What is the patient is wrong on the first letter ?
2. We've implemented it, we will show you next.
3. Currently, Dicotomix aimed to be used in everyday life, not for writing a book !

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First, get in touch with people

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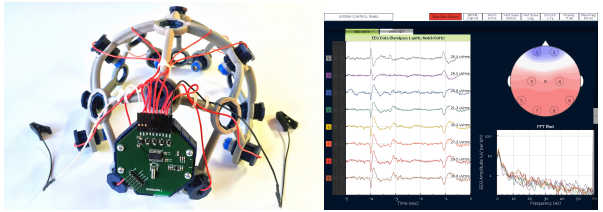
BCI (Brain Computer Interface)



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Use of BCI for people who cannot move anything.

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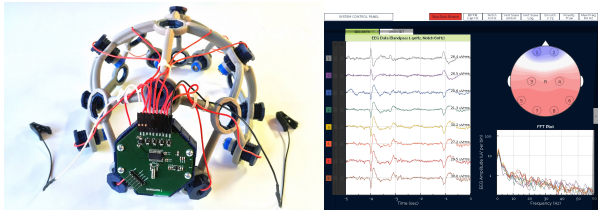

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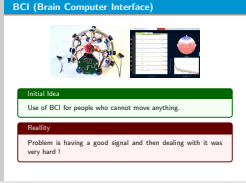
Reallity

Problem is having a good signal and then dealing with it was very hard !



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The ergonomy of Dicotomix

content...

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- Hôpital Lyon Nord
- a few patients
- a training phase and a evaluation phase

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With the help of:

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- ARSLA
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