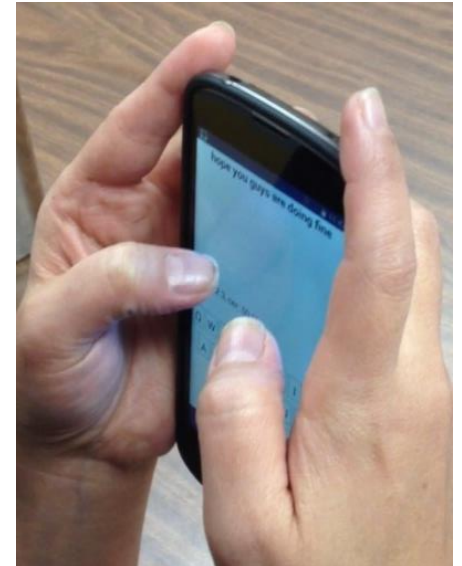
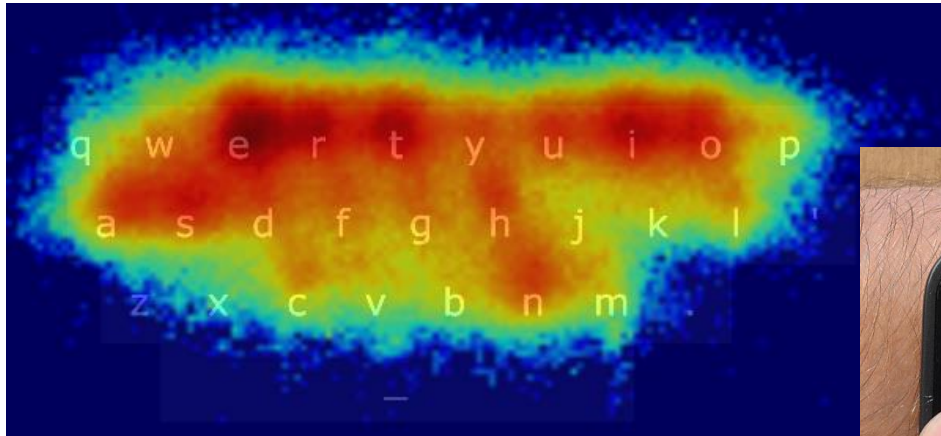
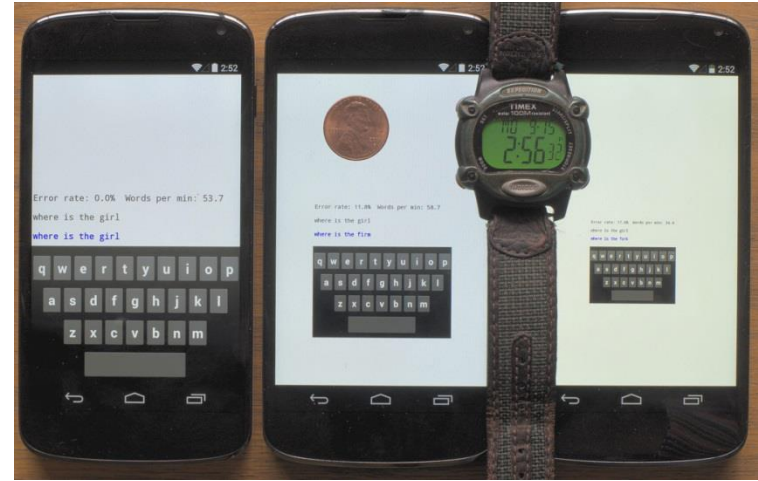


Extreme Texting



Keith Vertanen, <http://keithv.com>, vertanen@mtu.edu

Multitasking: A Human Delusion?

"People can't multitask very well, and when people say they can, they're deluding themselves," said neuroscientist Earl Miller. And, he said, "The brain is very good at deluding itself."

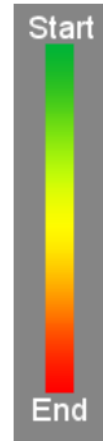
Miller, a Picower professor of neuroscience at MIT, says that for the most part, we simply can't focus on more than one thing at a time.

<http://www.npr.org/templates/story/story.php?storyId=95256794>

	2010	2011	2012	2013	2014	2015
Distracted Driving Deaths	3,092	3,331	3,328	3,154	3,179	3,477
All Motor Vehicle Deaths	32,999	32,479	33,782	32,894	32,744	35,092
Distracted Driving Injuries	416,000	387,000	421,000	424,000	431,000	391,000
All Motor Vehicle Injuries	2,239,000	2,217,000	2,362,000	2,313,00	2,338,000	2,443,000

VelociTap: From taps to text

Given a noisy tap sequence:

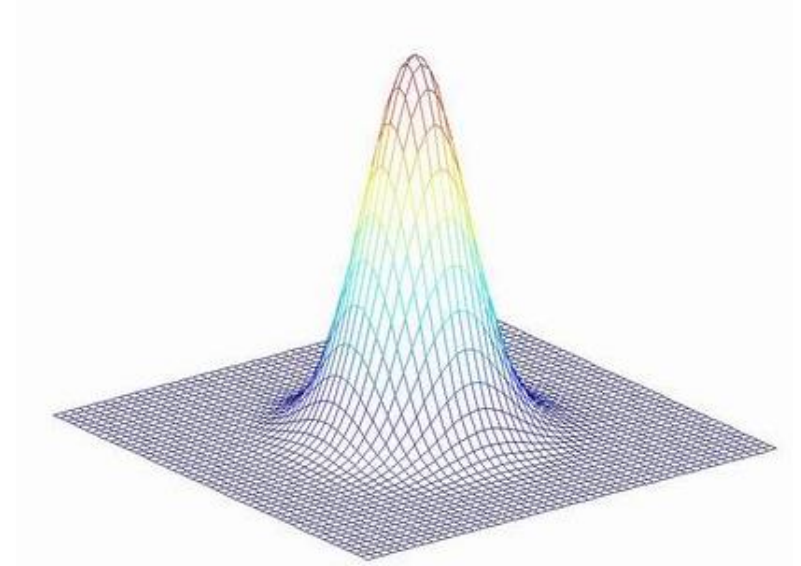


Guess the user's intended text:

have a good day	0.06
have a food day	0.01
have a fod day	0.004
have a god day	0.0006
...	

$$P(\text{Letters}|\text{Taps}) \propto \underbrace{P(\text{Taps}|\text{Letters})}_{\text{touch model}} \underbrace{P(\text{Letters})}_{\text{language model}}$$

VelociTap: Touch modeling



*2D Gaussians centered at each key.
Separate variances in the x- and y-dimensions.*

$$P(\text{Letters}|\text{Taps}) \propto \underbrace{P(\text{Taps}|\text{Letters})}_{\text{touch model}} \underbrace{P(\text{Letters})}_{\text{language model}}$$

Character language modeling

Call me Ishmael. Some years ago- never mind how long precisely- having little or no money in my purse, and nothing particular to interest me on shore, I thought I would sail about a little and see the watery part of the world. It is a way I have of driving off the spleen and regulating the circulation. Whenever I find myself growing grim about the mouth; whenever it is a damp, drizzly November in my soul; whenever I find myself involuntarily pausing before coffin warehouses, and bringing up the rear of every funeral I meet; and

What letter comes next?

It was a?

I want to go to t?

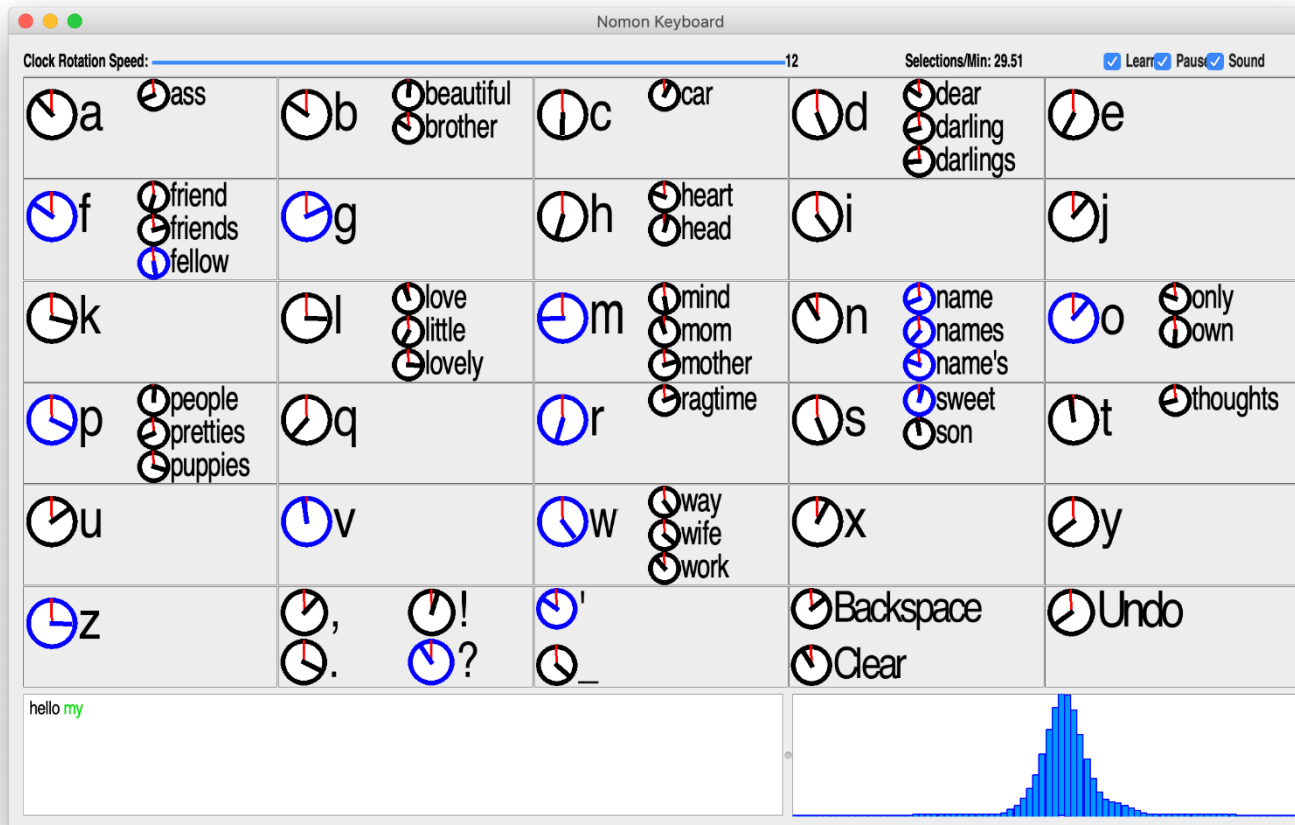
n-gram	count
aa	4
...	
am	1695
an	10435
ao	14
...	
tg	2
th	15570
ti	4246
...	
zz	42

Word language modeling

What word comes next?

Can you send ???

I want to go to the ???



n-gram	count
send me	1547
send you	2353
send it	343
send hippo	1
...	
the end	13
the start	455
the bill	235
the cat	2534
the best	5646
...	

Newsire (272M words)

I agree spending under Bush was very bad, but Obama has been worse.

Can Zuma hold a nation together?

Like many of Ducasse's own intricate recipes, some require a fabulous amount of ingredients.

Five Victorian parks and squares in the Isle of Man are to be closed to the public in a bid to reduce vandalism.

Americans trying to impress Europeans!

If a firearm has been reproofed, it is a sign of previous wear.

One of the most popular couch surfing networks is CouchSurfing.com, where citizens of the world meet and arrange couch stays with other travelers.

NASA's spending problems are so predictable and big that two years ago Congress put it under the same tough budgeting rules as the Defense Department.

Now, replicas of old people, decrepit and toothless, move slowly about in motorised wheelchairs.

Wikipedia (1.4B words)

Co Co Wheats is made of wheat farina, cocoa, and additional flavorings.

The US built an aircraft where the jet exhaust drove the fans, while British projects not built included fans driven by mechanical drives from the jet engines. These trials involved military pilots from the United States, the United Kingdom and Canada.

What is confusing to me, Scribner, is that the details you want included are already there.

If you disagree, please consider taking it to AfD. Hello, I received the message about the Jaws Project page. The new page has been deleted so fast that I haven't had the time to reply and then there was no discussion.

If you can, please, could you copy and paste the old page in my talk page, so that I can give it a read?

Since they revert the article in teams, they do not trigger the blocking that this should receive. They simply do it, resulting in an inaccurate, defamatory entry. I showed above, in detail, the problem with their entry and with the external links they keep inserting.

Twitter (16.4B words)

Deep thinkers have the hardest time with relationships and religion.

Where's Stephen Curry at?

How can you tell someone you love them but let them go to bed crying?

How did I not know about car washes with neon lights? This is going on my list of nice sensory things in the world.

Only can buy in tradisional.

Impatiently waiting on Corey to get here!

This happening right now!

What other media does BRS has? I'm hearing people being disappointed at their favourite characters not getting much screen time.

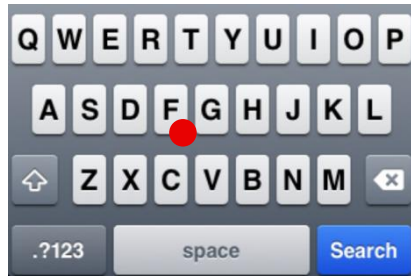
I've been looking forward to this day for so long, can't believe it's already here!

His base would just love them! So sad there are so many of those idiots.

The Underground Taproom.

Training corpus	Words (M)	Example sentence
Yelp reviews	470	Wonderful customer service, always on time, and friendly!
Amazon reviews	3,997	I bought this camera specifically to take with me on a cruise.
Blog posts	599	After quickly inspecting her surroundings, her eyes snapped over to Sakon.
Project Gutenberg books	1,180	He tells some very interesting tales of early days in the West.
Apache email messages	167	Other parts can be released separately by people interested.
Web forum messages	278	This will give you a good guide on where you stand in your progression as a player.
Newswire	272	Can Zuma hold a nation together?
Movie subtitles	677	I managed to scrape up enough money to pay for him a ticket.
Social media updates	829	For all my wrestling family, must read story.
Reddit messages	70,318	I'm trying to think of what to make everyone.
Twitter	16,396	Impatiently waiting on Corey to get here!
Common crawl web text	184,647	Some of the organisers have also been Finnish citizens.
Wikipedia	1,462	What is confusing to me, Scribner, is that the details you want included are already there.
Usenet posts	1,615	Two hours later I get another call.

VelociTap: Decoder



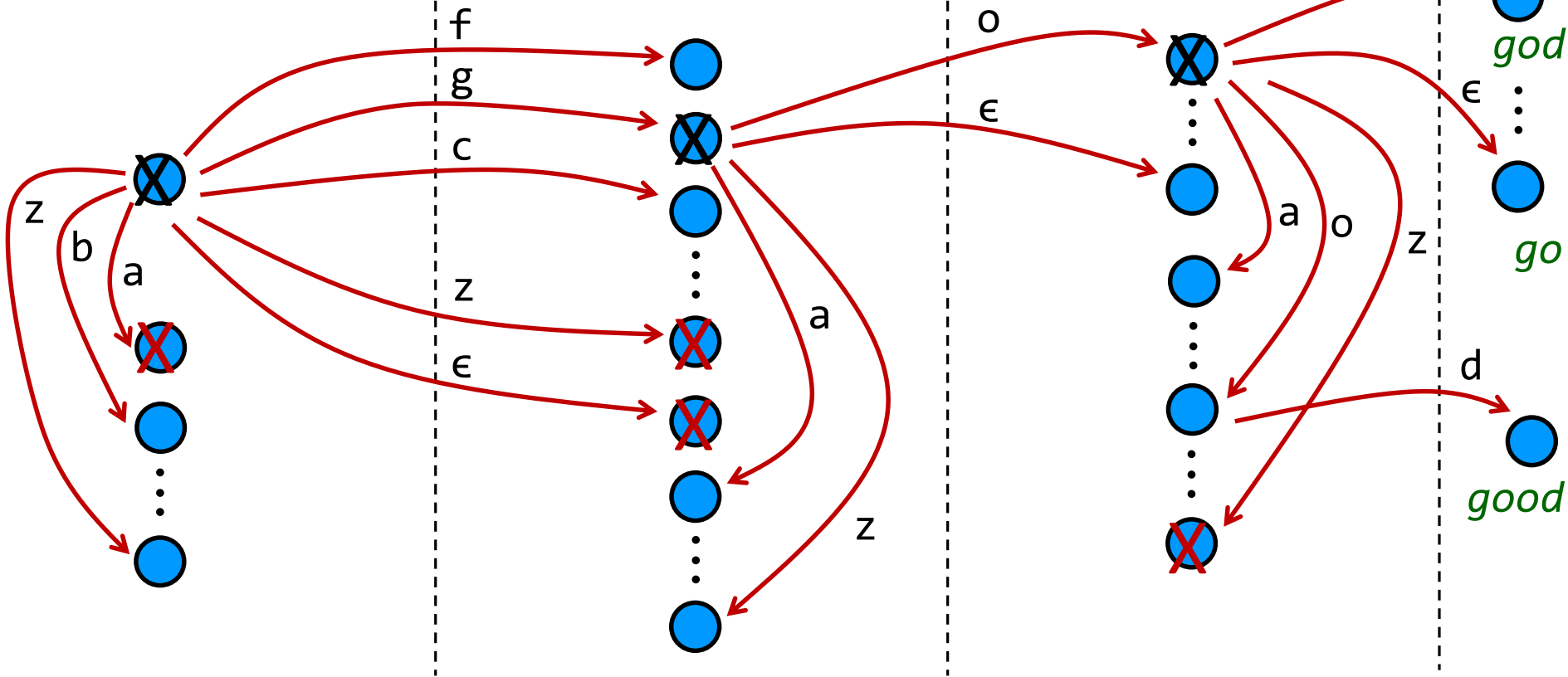
Observation 1



Observation 2



Observation 3



Tokens track: probability, LM context, traceback

Beam prune to keep tractable

Augmentative and Alternative Communication (AAC)

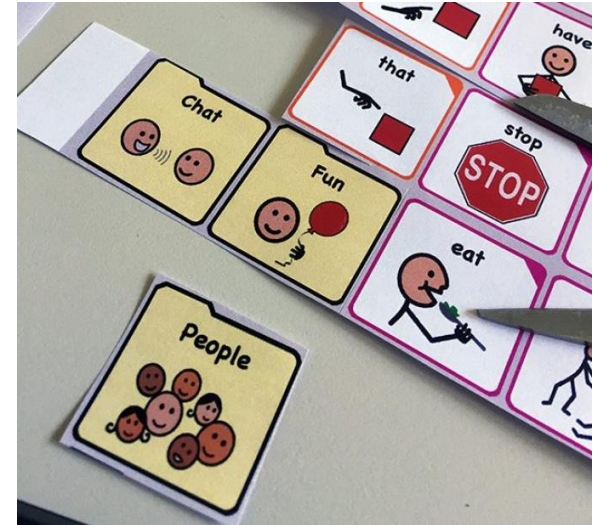
- **Communication without speech**
 - Wide range of options, reflecting range of users
 - Differing motor abilities
 - Differing cognitive abilities
 - May or may not be literate
- **No tech**
 - No extra tool or device requires
 - E.g. gestures, body language, pointing, facial expressions, sign language, eye movement, non-verbal vocalizations
 - May be difficult for people unfamiliar with user

Augmentative and Alternative Communication (AAC)

- Low-tech AAC
 - Paper
 - Communication board



<https://www.communicationmatters.org.uk/page/communication-cards>



<https://www.assistiveware.com/blog/making-a-paper-based-aac-book>

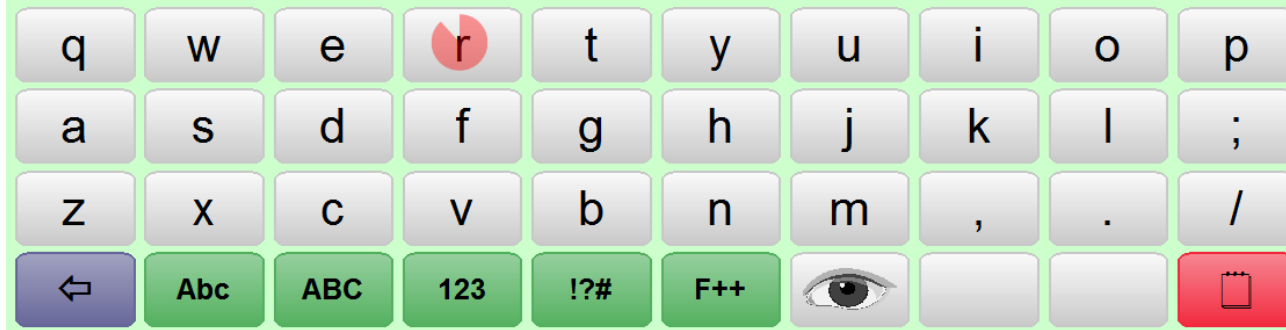


Augmentative and Alternative Communication (AAC)

- **High-tech AAC**
 - Device speaks or produces text
 - Speaking users: 150+ words-per-minute
 - Literate AAC users: often < 10 wpm



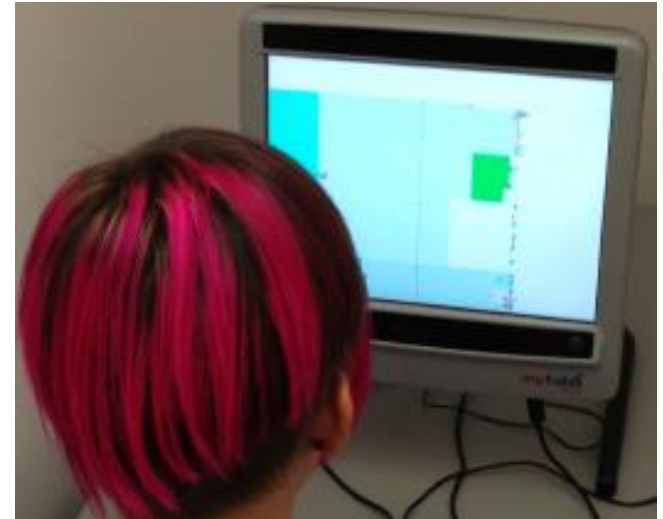
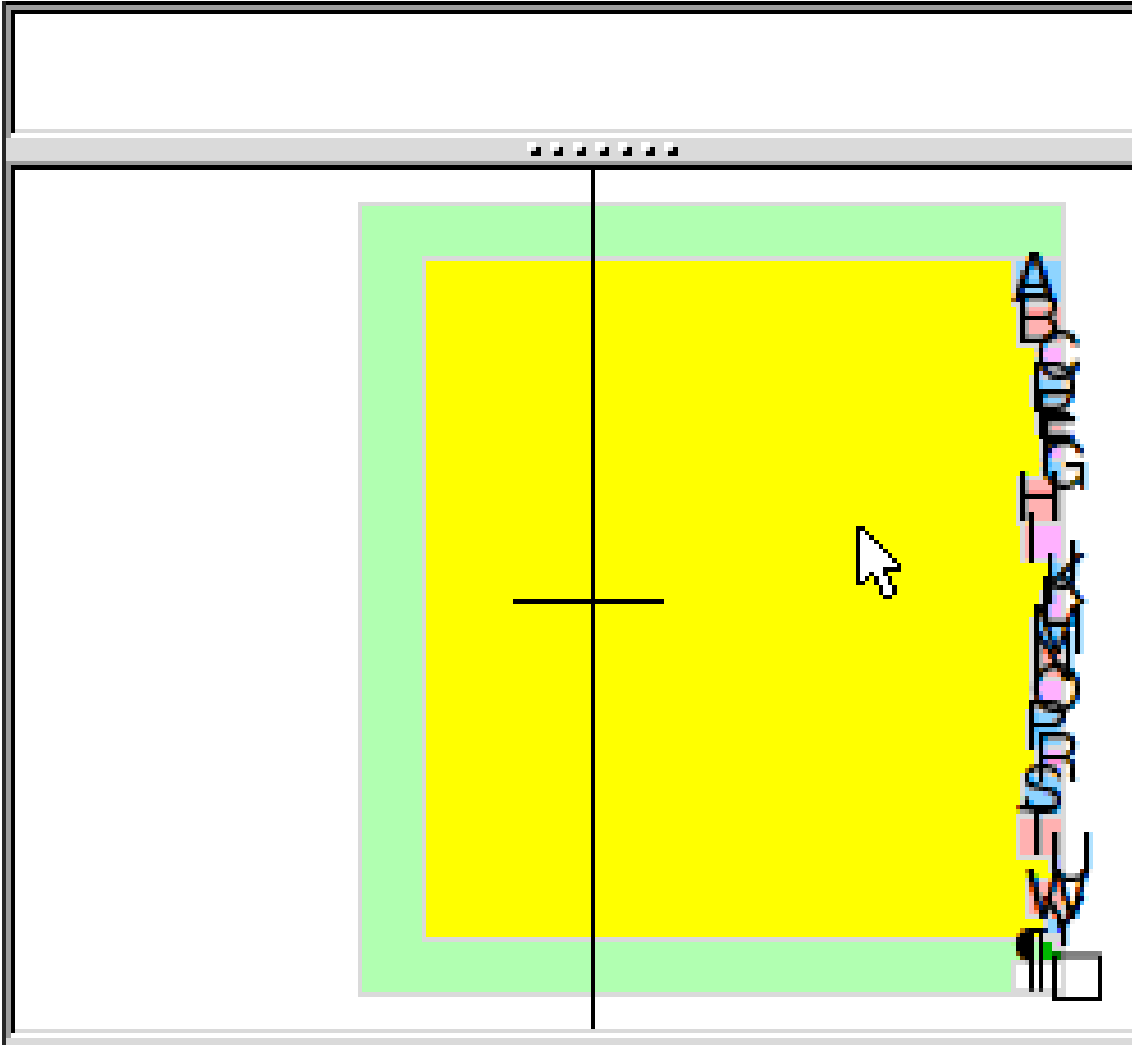
Writing with your eyes



Dwell-clicking
~6 wpm
(words-per-minute)



Writing with your eyes



Dasher navigation

~14 wpm

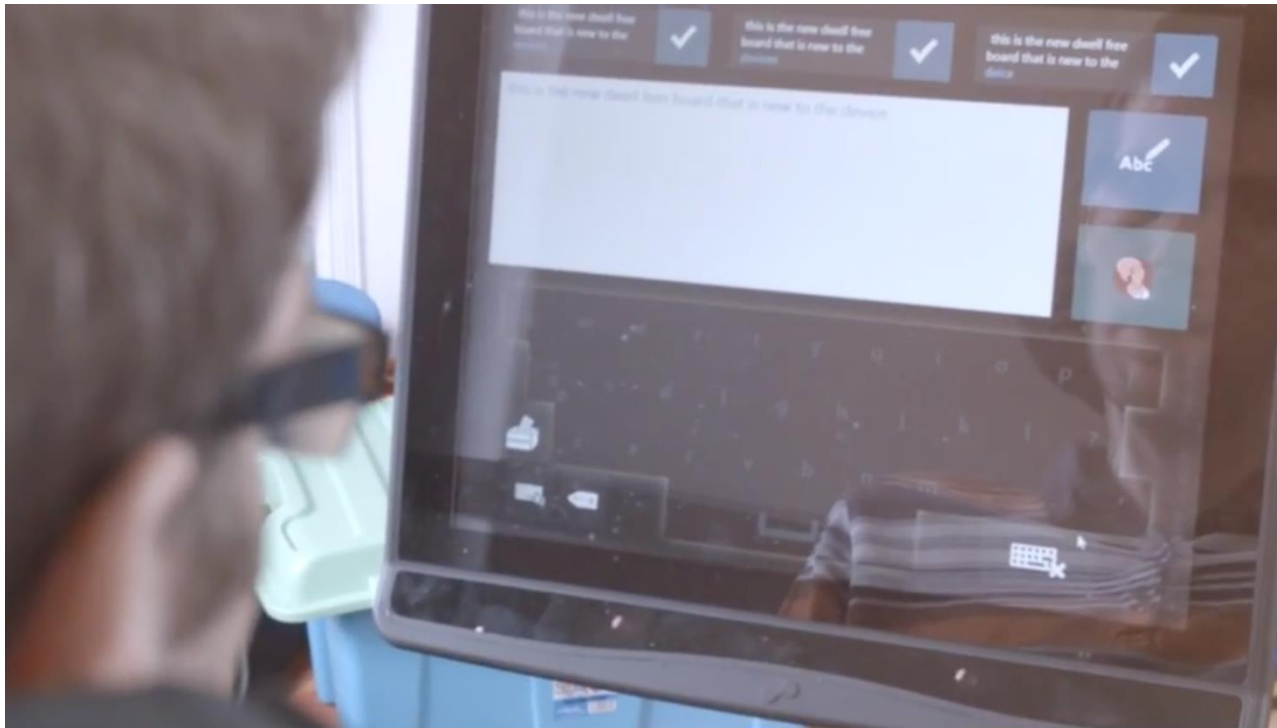
Writing with your eyes ●

q w e r t y u i o p
a s d f g h j k l '
z x c v b n m .

Dwell-free
eye-typing

Potential:

46 wpm



Writing with a single switch



<https://www.wired.co.uk/article/stephen-hawking-intel-communication-system>



space	E	A	R	D	U
T	O	I	L	G	B
N	S	F	Y	V	J
H	C	P	K	Q	.
M	W	X	Z	,	?

Row-column
scanning
~3 wpm

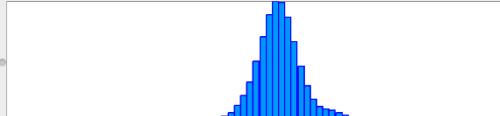
Writing with a single switch

Nomon Keyboard

Clock Rotation Speed: 12 Selections/Min: 29.51 ☒ Learn ☒ Pause ☒ Sound

a class	b beautiful brother	c car	d dear darling darlings	e
f friend friends fellow	g	h heart head	i	j
k	l love little lovely	m mind mom mother	n name names name's sweet son	o only down
p people pretties puppies	q	r ragtime	s	t thoughts
u	v	w way wife work	x	y
z	, . ! ?	' _	Backspace Clear	Undo

hello my



Nomon:
~6 wpm



Dr. Tamara Broderick



Mr. Nicholas Bonaker



Dr. Emli-Mari Nel



Dr. Keith Vertanen