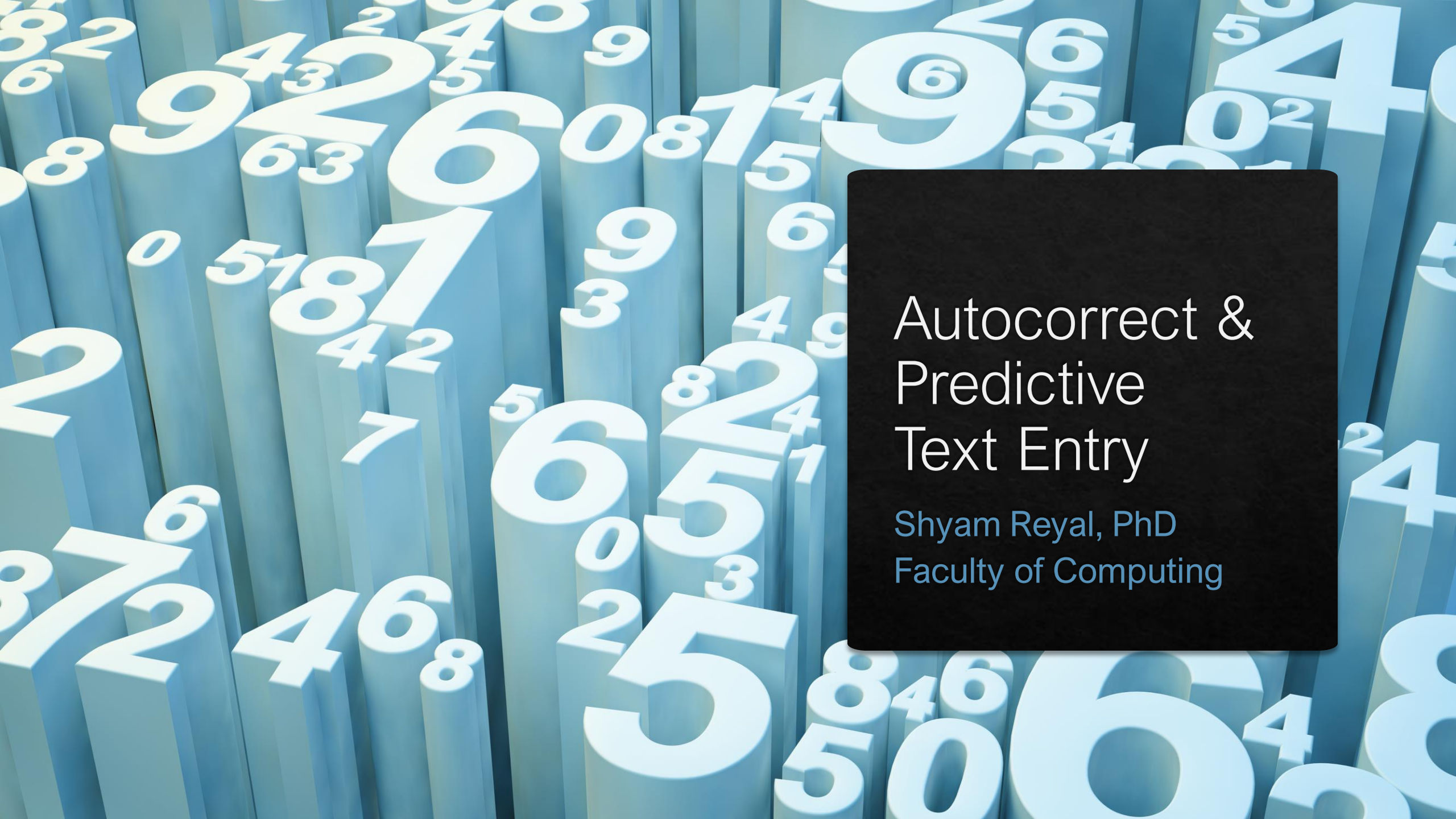

Autocorrect & Predictive Text Entry

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Faculty of Computing


Have you finished the paper yet?
No
Why not?
Because I'm a prostitute
Well I'm sorry to hear that....
PROCRASTINATOR. I MEAN IM A PROCRASTINATOR!!
why me...
Read 10:37 AM
stupid iPhone 😂
DAMN YOUAUTOCORRECT.COM
Send


Messages
In Case Of Em...
Edit
Love u
How's the morning sickness?
Not too bad today. I can't believe that we're having another baby :)
I'm leaving you
WHAT???!!!!!!!!!
now. I'm leaving work NOW. I am NOT leaving you!
Now I'm really gonna throw up
autocorrectfail.org
Send

Autocorrect & Predictive Text Entry

At the end of this lesson, you would be able to:

- Explain how modern text entry systems perform autocorrect and word prediction
- Describe the risks associated with modern autocorrect and predictive text entry
- Explain and apply how to get the best performance and user-experience from your smartphone's autocorrect and predictive text entry features

Autocorrect

Automatically correcting misspelt words as you type

Next Word Prediction

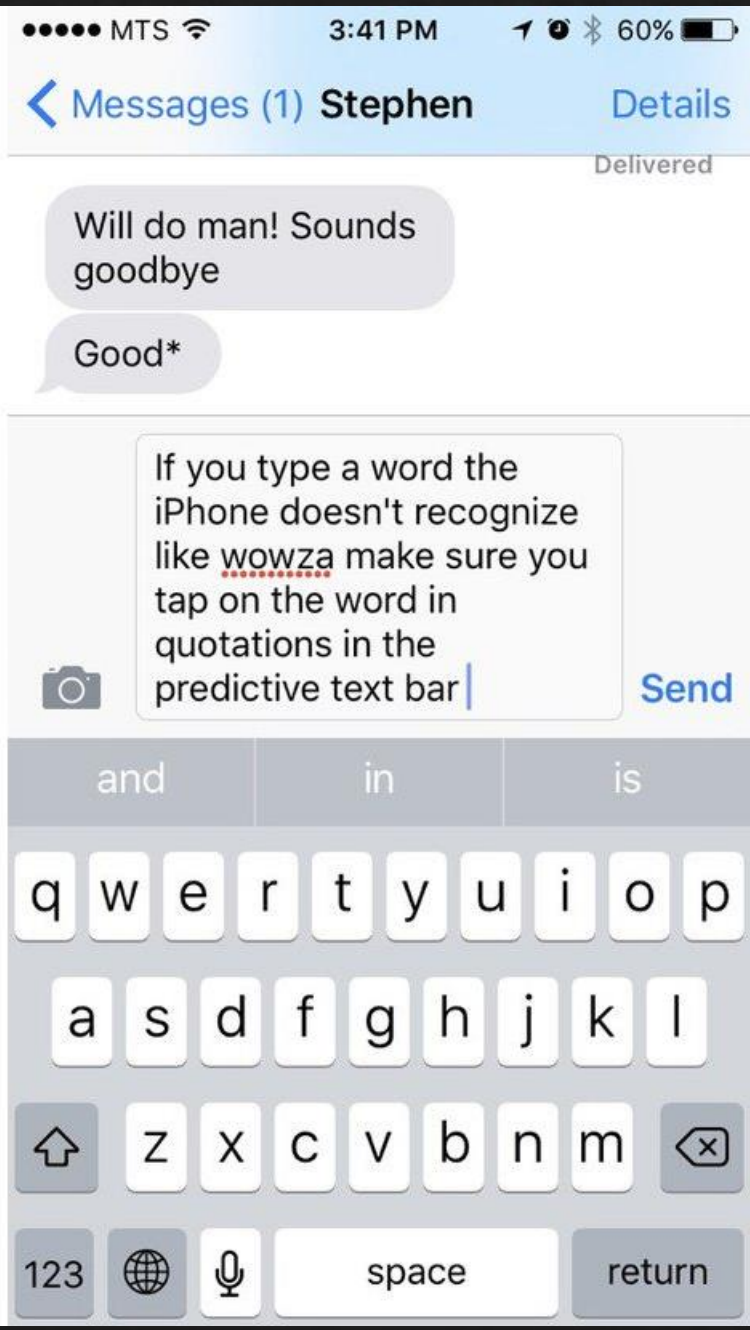
Predicting the next word based on what has been already typed

Introduction


MTS 3:36 PM 62%
Messages (1) Stephen Details
offer the free ticket up.
And rock out for me.
Delivered
Will do man! Sounds goodbye
Good*
If you type a word the iPhone doesn't recognize like wowza
Send
"wowza" wows woes
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
123 space return


"wowza"

MTS 3:36 PM 62%
Messages (1) Stephen Details
offer the free ticket up.
And rock out for me.
Delivered
Will do man! Sounds goodbye
Good*
Send
woes
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
123 space return


MTS 3:41 PM 60%
Messages (1) Stephen Details
Delivered
Will do man! Sounds goodbye
Good*
If you type a word the iPhone doesn't recognize like wowza make sure you tap on the word in quotations in the predictive text bar
Send
and in is
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
123 space return

By Using Probabilistic Models

Language Models

Created using N-grams

Could be character based or word based

Requires collecting training text

Spatial Models

Distribution of probabilities over a tap target

As a solution for the fat-finger-problem

And not having physical key boundaries

By Using Probabilistic Models

Language Models

Created using N-grams

Could be character based or word based

Requires collecting training text

S tial M dels

Dist on of probab ze p target

As a s for the fat-fi em

And not daries

this is the house that Jack built.
this is the malt that lay in the house that Jack built.
this is the rat that ate the malt
that lay in the house that Jack built.
this is the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the cow with the crumpled horn
that tossed the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.

Let’s do some n-gram counting

this is the house that Jack built.

this is the malt that lay in the house that Jack built.
this is the rat that ate the malt
that lay in the house that Jack built.
this is the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the cow with the crumpled horn
that tossed the dog that worried the cat
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this is the dog that worried the cat
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that lay in the house that Jack built.
this is the cow with the crumpled horn
that tossed the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.

Unigram (1-gram)	F
the	22
that	21
this	6
is	6
house	6
Jack	6
built	6
malt	5
lay	5
In	5
ate	4

this is the house that Jack built.

this is the malt that lay in the house that Jack built.
this is the rat that ate the malt
that lay in the house that Jack built.
this is the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the cow with the crumpled horn
that tossed the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.

Bigram (2-gram)	F
this is	6
is the	6
the house	6
house that	6
that Jack	6
Jack built	6
that lay	5
in the	5
lay in	5
malt that	5
the malt	5

this is the house that Jack built.

this is the malt that lay in the house that Jack built.
this is the rat that ate the malt
that lay in the house that Jack built.
this is the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.
this is the cow with the crumpled horn
that tossed the dog that worried the cat
that killed the rat that ate the malt
that lay in the house that Jack built.

Trigram (3-gram)	F
this is the	6
the house that	6
house that Jack	6
that Jack built	6
that lay in	5
the malt that	5
in the house	5
lay in the	5
malt that lay	5
built this is	5
Jack built this	5

Text:

Trigram (3-gram)	F
this is the	6
the house that	6
house that Jack	6
that Jack built	6
that lay in	5
the malt that	5
in the house	5
lay in the	5
malt that lay	5
built this is	5
Jack built this	5

Top 3 next word suggestions:

- this
- the
- house

Text: t

Trigram (3-gram)	F
this is the	6
the house that	6
that Jack built	6
that lay in	5
the malt that	5

Top 3 next word suggestions:

- this
- the
- that

Text: th

Trigram (3-gram)	F
this is the	6
the house that	6
that Jack built	6
that lay in	5
the malt that	5

Top 3 next word suggestions:

- this
- the
- that

Text: the

Trigram (3-gram)	F
the house that	6
the malt that	5

Top 3 next word suggestions:

- house
- malt

Text: the h

Trigram (3-gram)	F
the house that	6

Top 3 next word suggestions:

- house

Text: the hi

Trigram (3-gram)	F
the house that	6

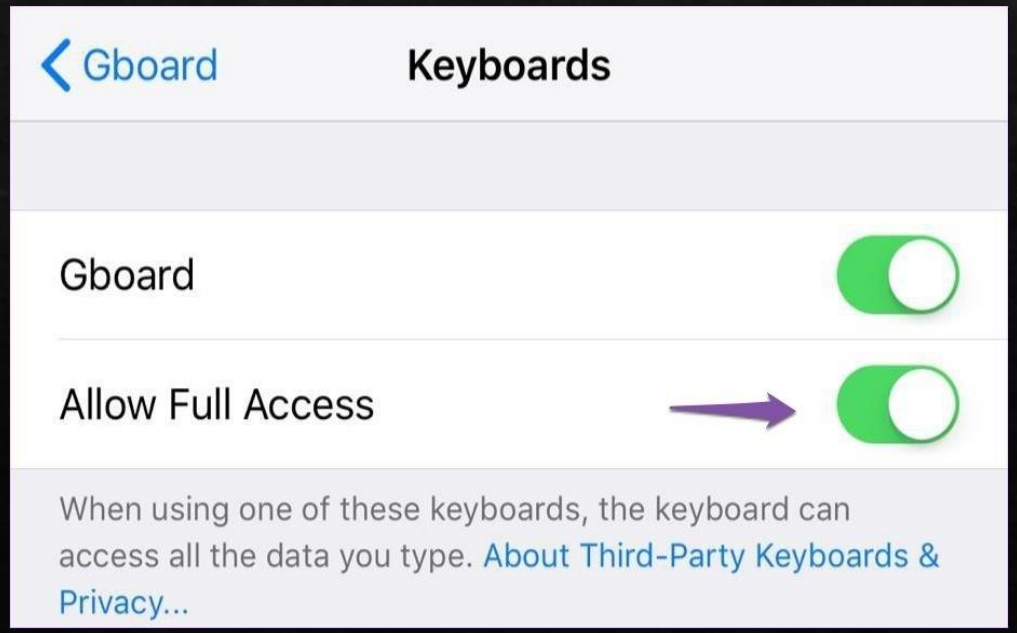
Top 3 next word suggestions:

- house (autocorrect)

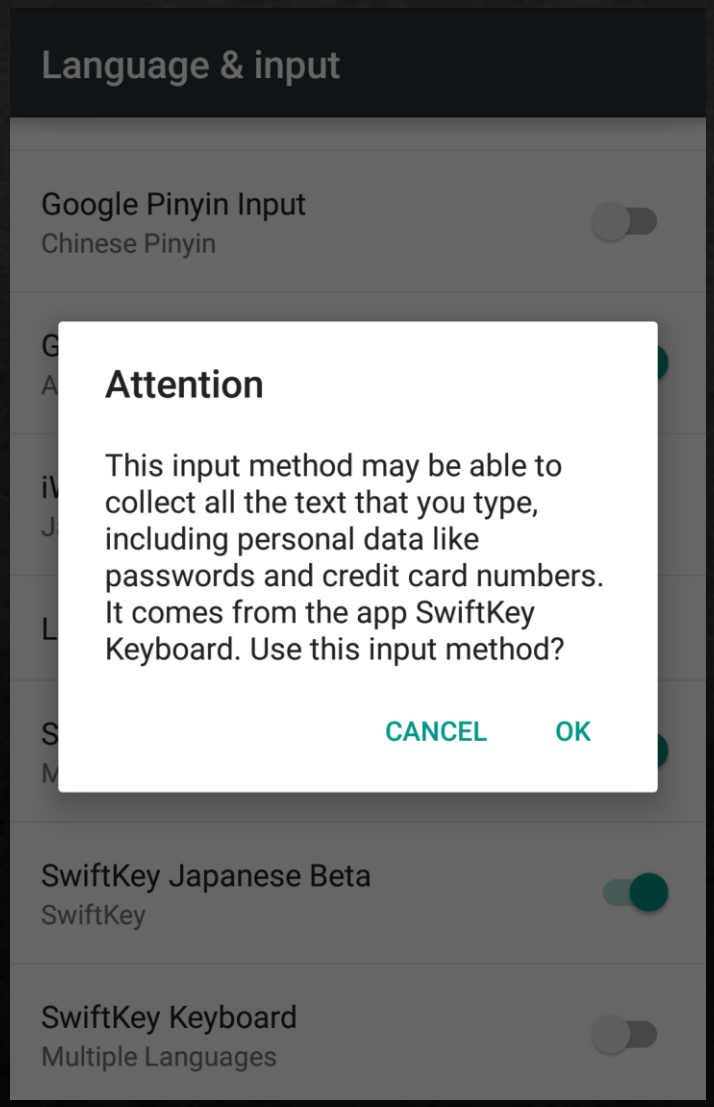
Where do these texts come from?

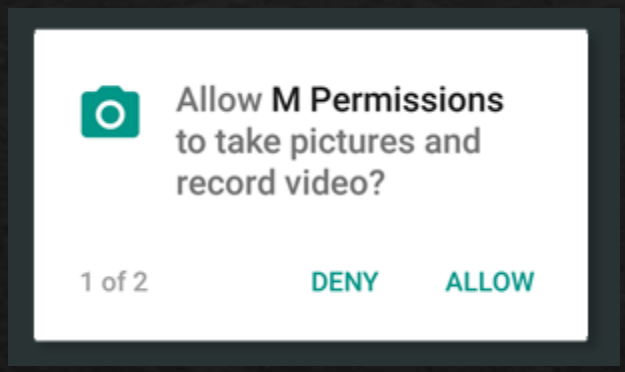
- For Android/Google Keyboard
  - Prebuilt Corpus provided on installation
- If Personalized dictionary is ON, collects
  - Typed texts using mobile keyboard
- If given consent, collects
  - Gmail Emails
  - Google Search Queries
  - Text on other Google Services

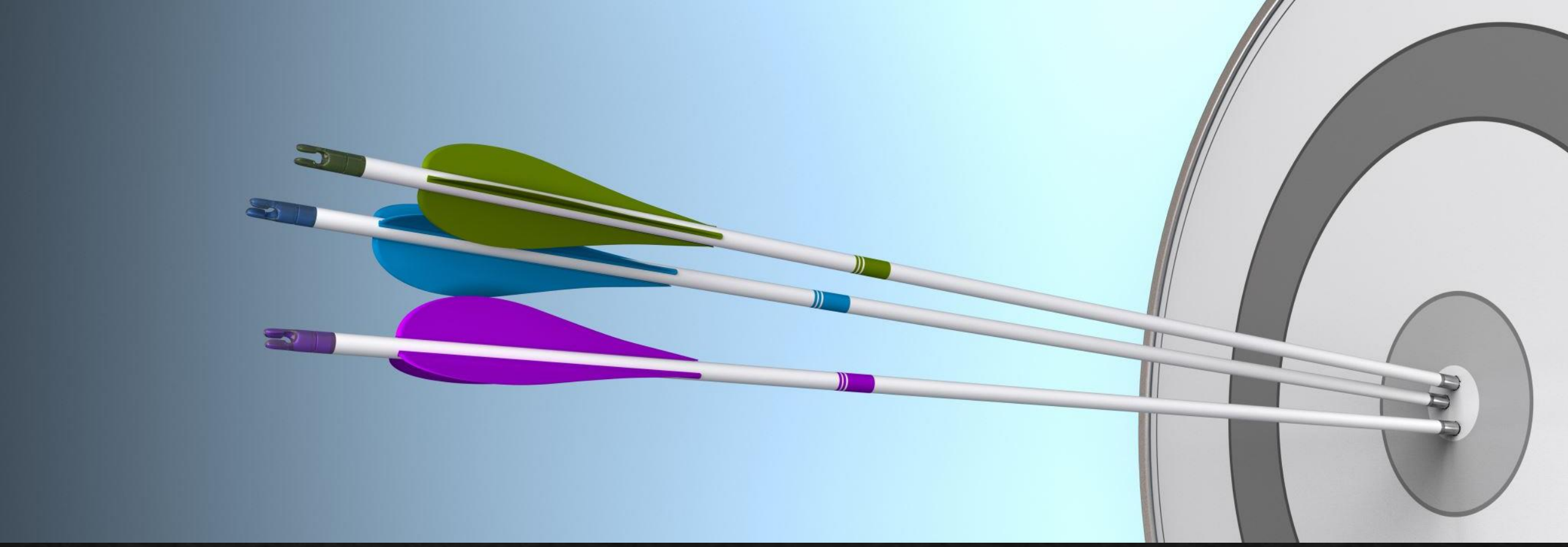
  On any device associated with Google Account



Risks and Mitigation







Maximize Performance, Accuracy and User Experience

Live Classroom Activity

Please join in with me – turn on your webcams – and take your smartphones

In the next slide, there will be a statement, type that into the SDC 05 WhatsApp group as fast as possible.

Keep autocorrect ON.

Let’s see who has the fastest fingers!

My favourite country is <name>

Live Classroom Activity

Please join in with me – turn on your webcams – and take your smartphones

In the next slide, there will be a different statement, type that into the SDC 05 WhatsApp group as fast as possible.

Keep autocorrect OFF

Let’s see who has the fastest fingers!

My favourite city is <name>

Improve User-Experience

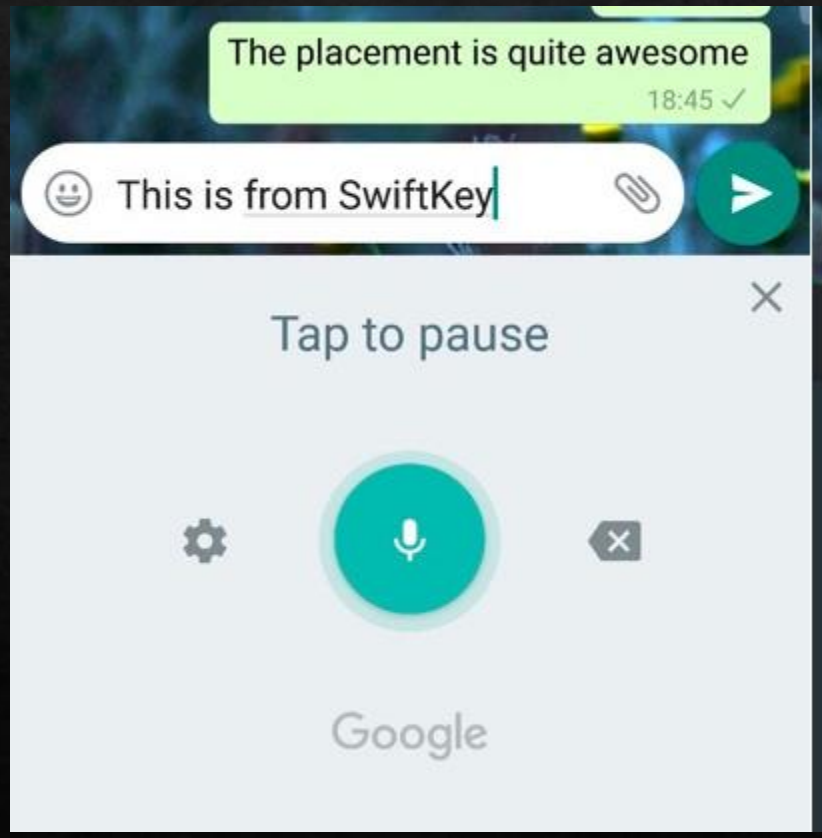
DO's

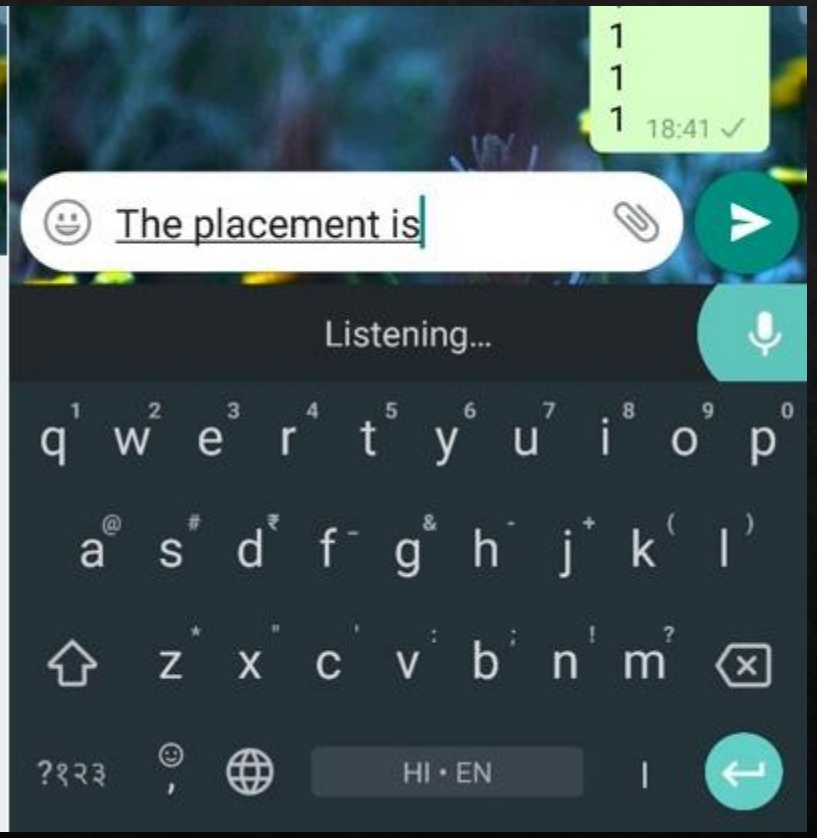
- Use auto-correct
- Use correct spellings when typing

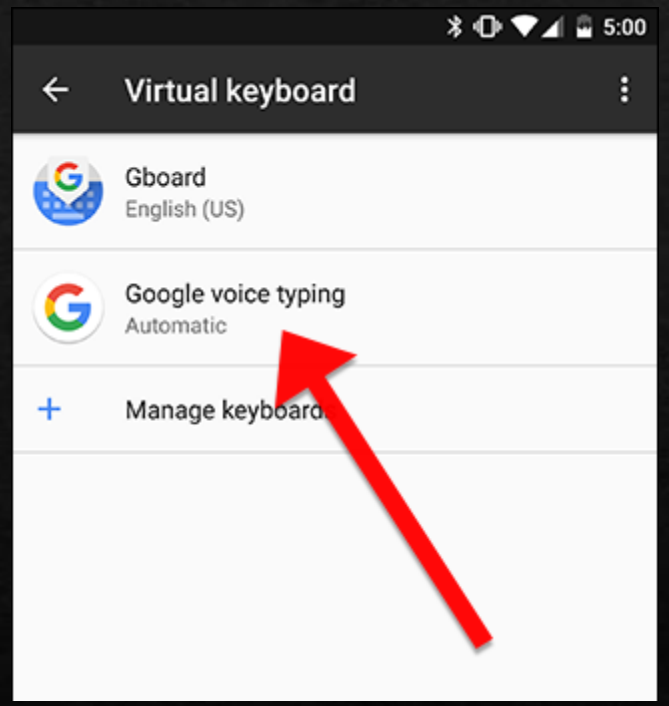
DON'T's

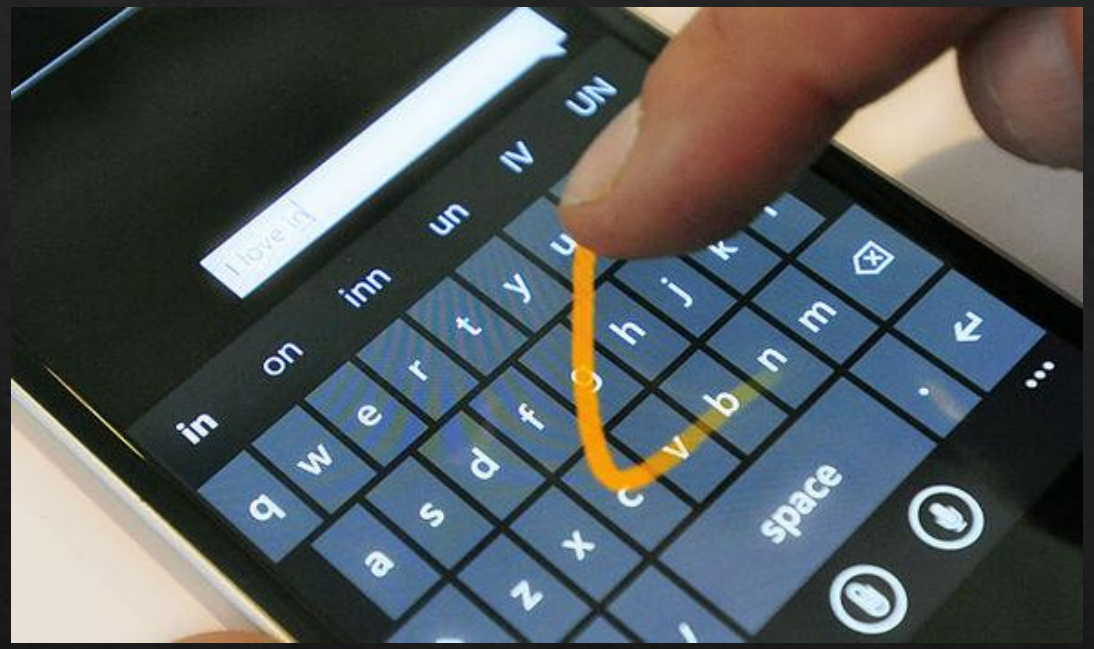
- Let others consistently use your phone
- Type in mixed languages – unless they keyboard is built for that purpose

Use SPEECH Input



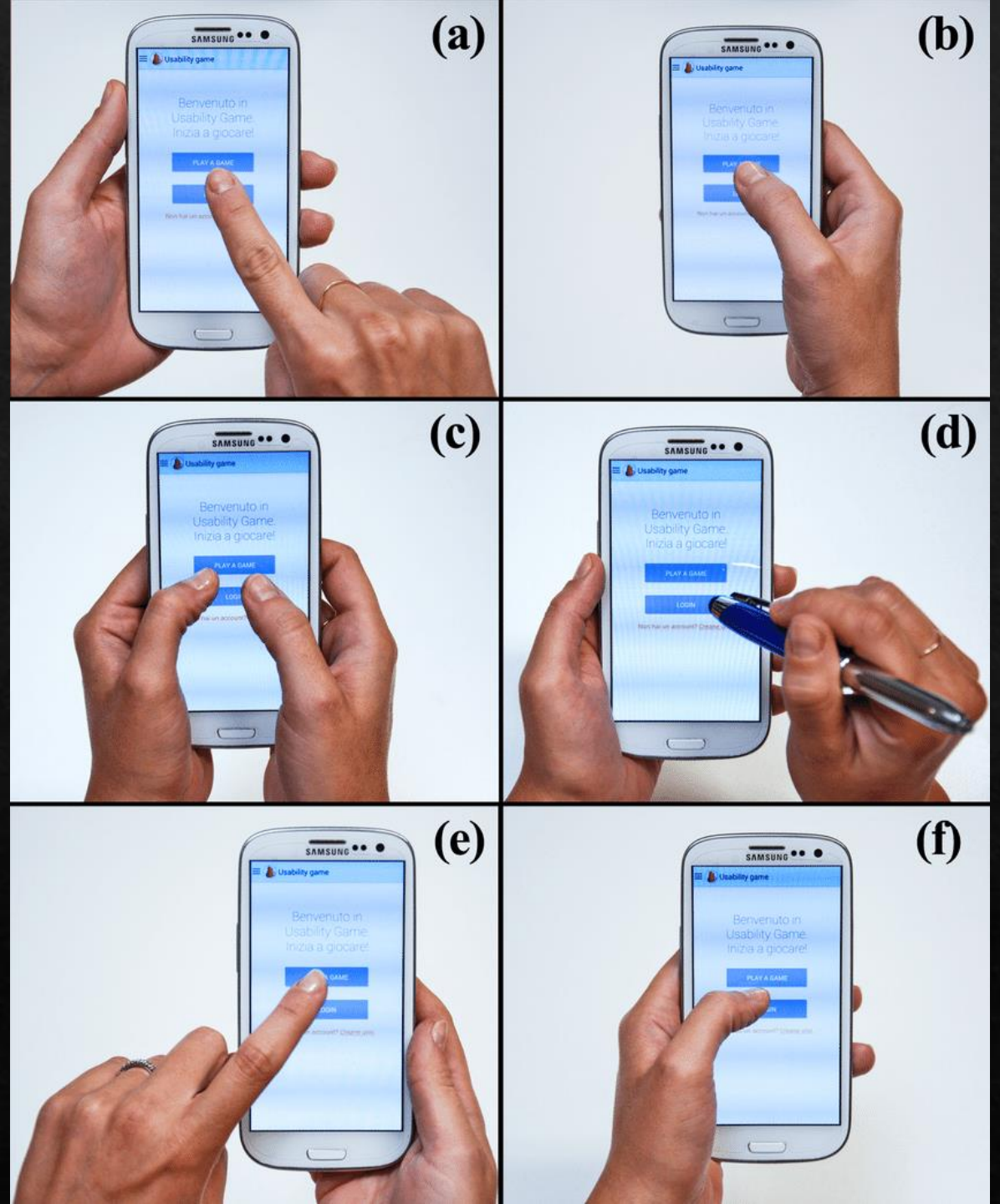


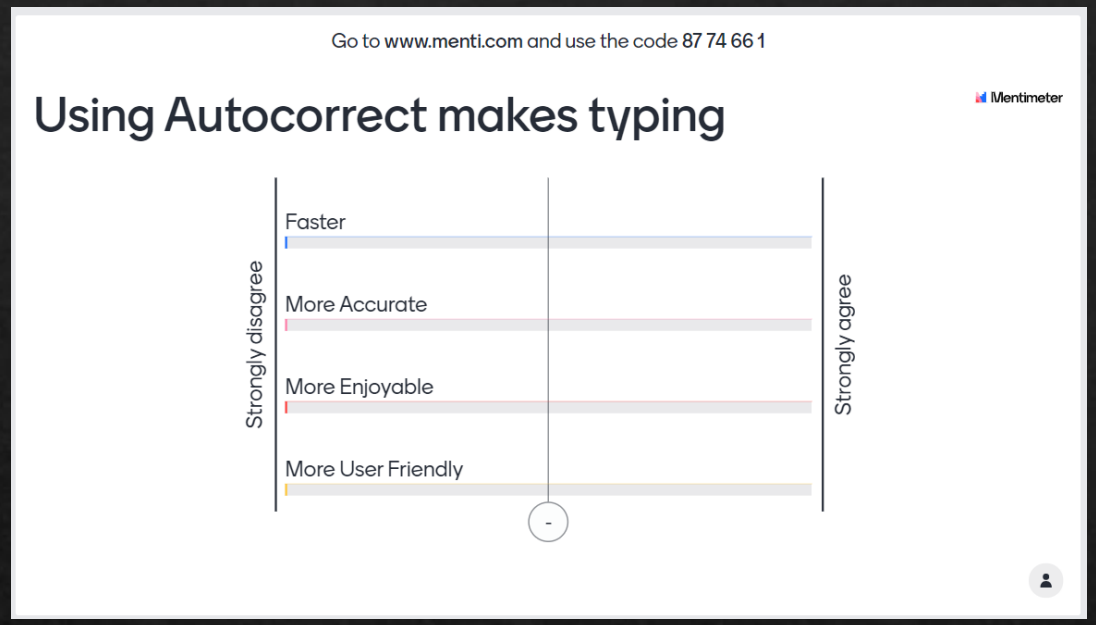


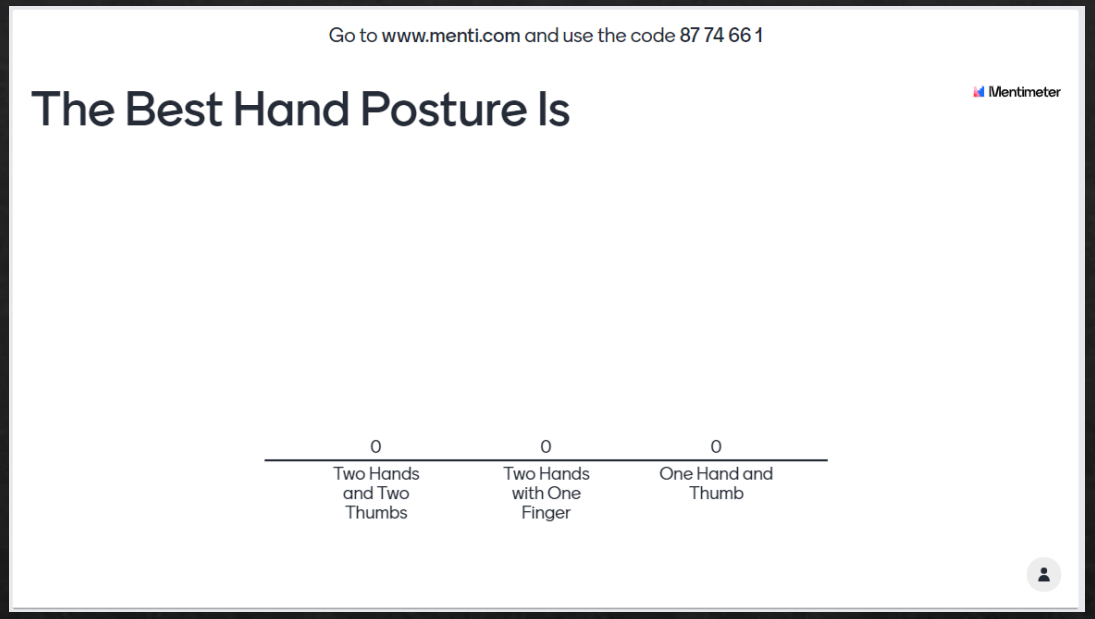


Use the Gesture Keyboard

Appropriate Hand Posture For Situation







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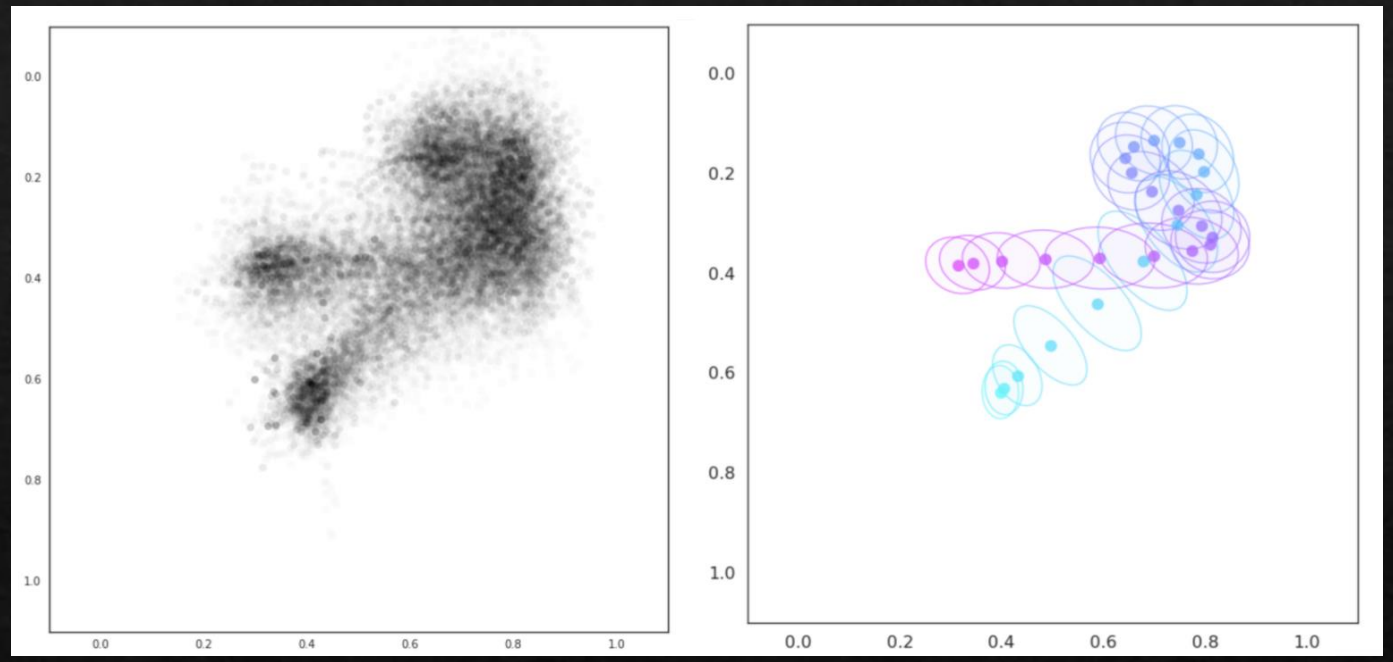
Please go to menti.com, use the above code and tell me about your experience

Next Lesson – Spatial Models



How spatial models affect autocorrect and predictive text entry

Summary

At this point, you would be able to:

- Explain how modern text entry systems perform autocorrect and word prediction using language models
- Describe the risks associated with modern autocorrect and predictive text entry
- Explain and apply how to get the best performance and user-experience from your smartphone's autocorrect and predictive text entry features