



Dicio voice assistant

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stypox.org | github.com/Stypox/dicio-android | at SFSCON 2025



WHAT IS DICIO?

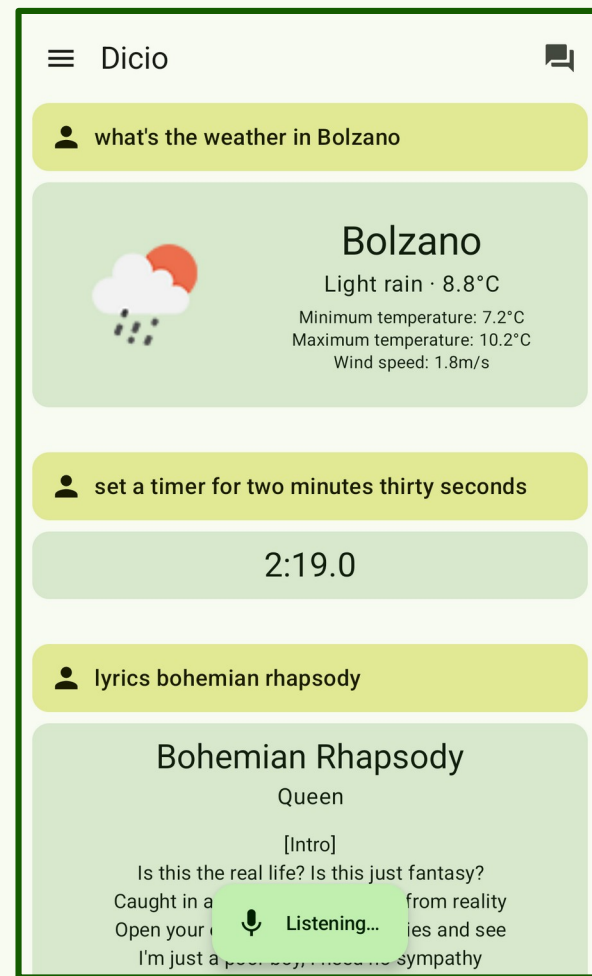
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Voice **assistant** for Android

Works fully **on-device**

Community-translated

13 skills and 14 languages





SKILLS

3/10



Weather



Search



Song lyrics



App opener



Calculator



Navigation



Telephone



Timer



Current time



Media control



Joke



Control wake word listening



Translate



call michael

Should I call Michael Smith?

0123 456789



go for it

Calling 0123 456789...



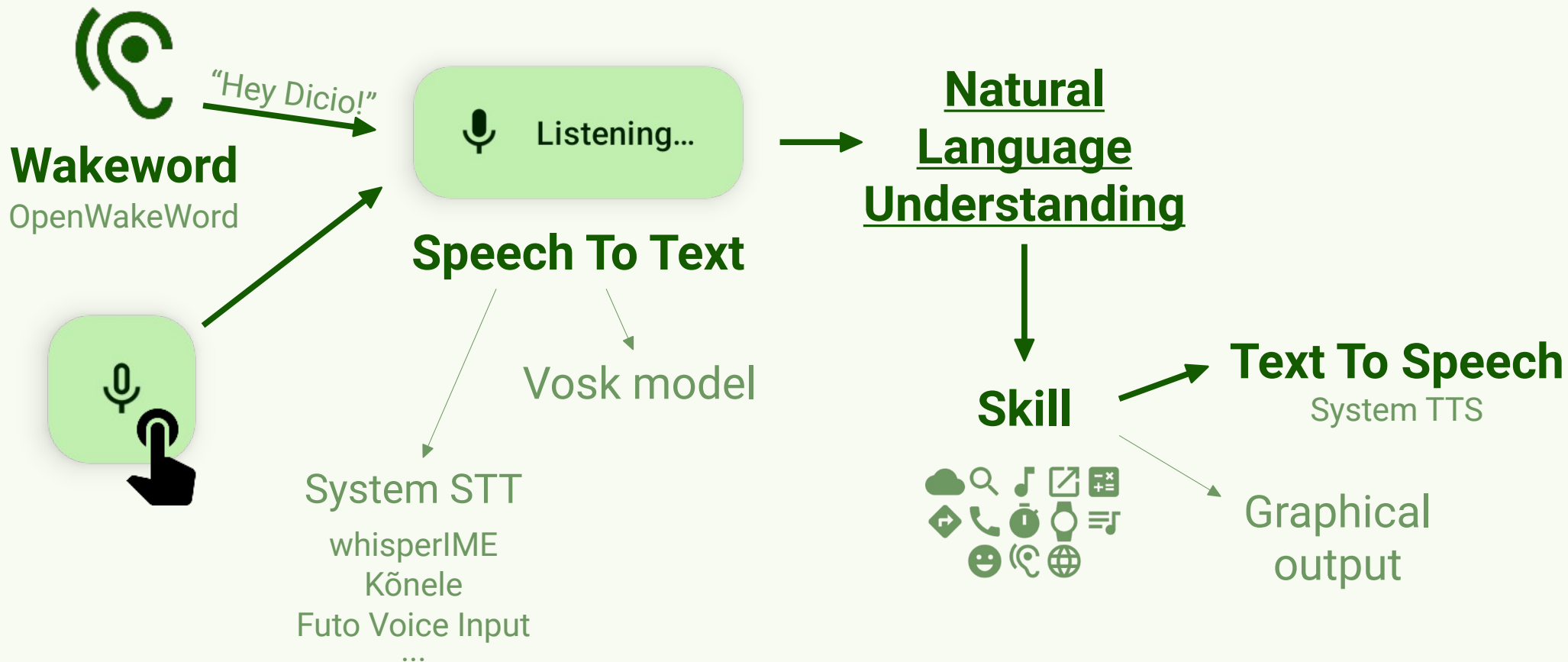
translate hola from spanish to italian

Ciao



Spanish (es) > Italian (it)





Compare **user sentence** to
set of **reference sentences**

Calculate **score**
and extract **entities**

 “How is the weather in Bolzano?”



what s|is the current? time

what s|is the? weather (in .place.)?

...

Match results

score: 90%

skill: weather

place: Bolzano



current:

- (what|how is|s)|whats the weather like? (in|on .where.)? 
- weather (in|on? .where.)?
- how is it outside
- is it cold|cool|warm|hot|sunny|rainy|raining (in|on .where.)|outside?

current:

- che? tempo|temperatura|meteo|(condizioni metereologiche?) fa|(c<i?> è)|(ci sono)? fuori|(all aperto|esterno)?
(<a|su><l|lla|llo|lle|gli?>|in? .where.)?
- (com<e?> è|(si sta))|(si sta bene) fuori|(all aperto|esterno) 
- è freddo|fresco|caldo|soleggiato|piovoso|nevoso fuori|(all aperto|esterno)|(<a|su><l|lla|llo|lle|gli?>|in .where.)?
- piove|neve|grandine|(sta piovendo|nevicando|grandinando)|(com|come è il tempo) (<a|su><l|lla|llo|lle|gli?>|in .where.)?
- (quali|come sono)|(che? cosa? dicono) le? previsioni (del? tempo)? (<a|su><l|lla|llo|lle|gli?>|in .where.)?

current:

- regnet|schneit|hagelt es draußen|(in .where.)?
- wie ist|wird das wetter draußen|(in .where.)?
- ist es kalt|warm|eisig|nebelig|regnerisch|verschneit|sonnig draußen? 
- regnet|schneit|hagelt es (in .where.)?
- ist es (in .where.)? kalt|warm|eisig|nebelig|regnerisch|verschneit|sonnig (in .where.)?





- Numbers, dates and durations

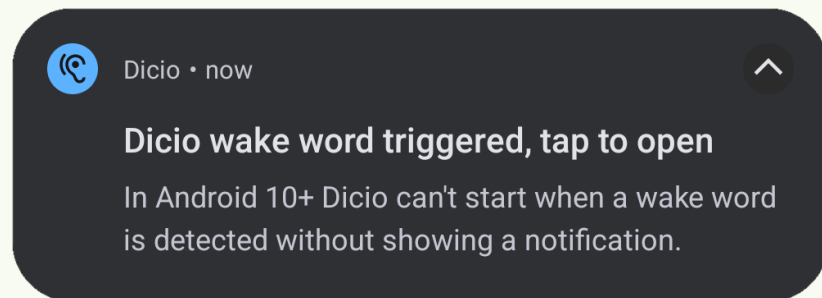
→ **dicio-numbers** 

- Language is **ambiguous**

→ why not use an LLM?

- **Android APIs** are cumbersome...

“two minutes and a half”
“three quarters” “ten thousand”
“November 7th” “next Wednesday”
“yesterday at noon”





- More **skills**
- Contribute **translations** from the app
- Better STT & TTS
- Skill **marketplace?**
- Integrations? (e.g. Home Assistant)





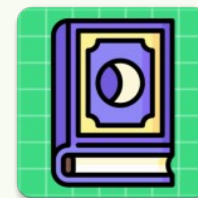
OpenVoiceOS (Mycroft fork)



Leon



Willow



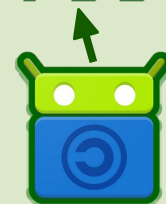
Sapphire



Home Assistant Voice



Questions?



Reach out – stypox.org or stypox@pm.me

dicio-android – github.com/Stypox/dicio-android

dicio-numbers – github.com/Stypox/dicio-numbers

on F-Droid – f-droid.org/packages/org.stypox.dicio



Bonus slides



```
- id: weather
  specificity: high
  sentences:
    - id: current
      captures:
        - id: where
          type: string
```



Java → Kotlin

Jetpack Compose UI toolkit

Model-View-ViewModel

Material 3 design

Hilt Dependency Injection

SharedPreferences → DataStore

Gradle .kts

...

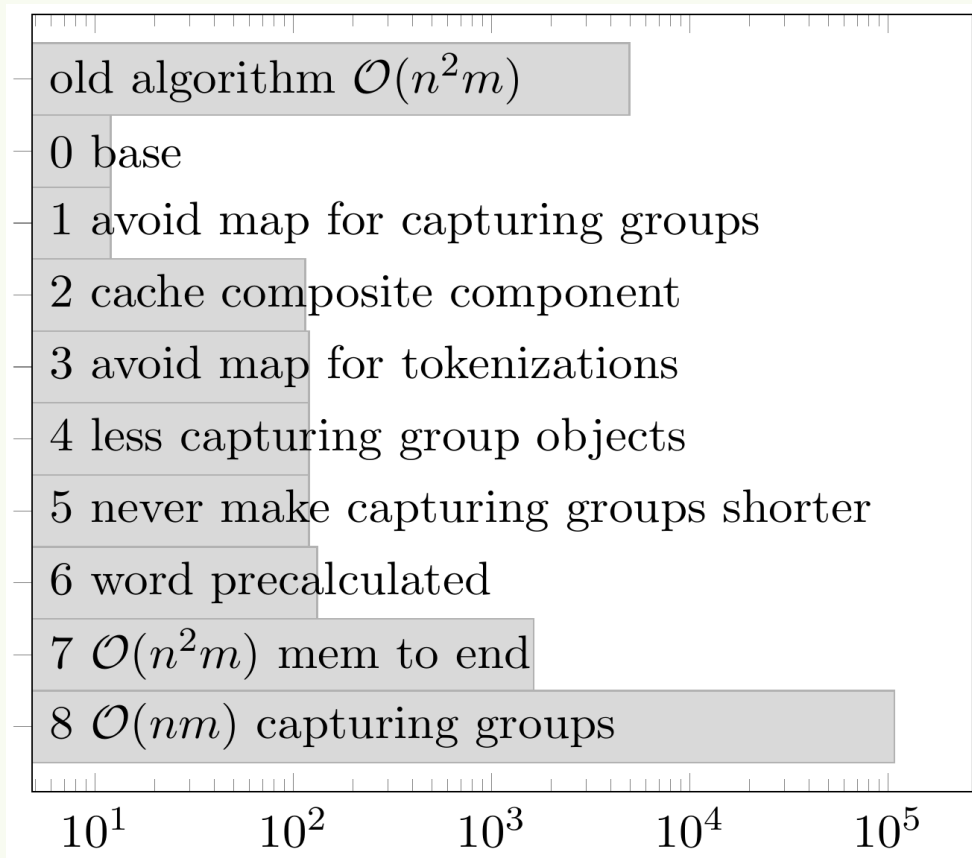




Reference sentence made of
(nested) **Components**

$O(n*m)$ bottom up

n and m are the number of
characters in the **user** and
reference sentences



Dicio

what's the weather in milan



Milan

Few clouds · 8.8°C

Minimum temperature: 7.2°C

Maximum temperature: 10.2°C

Wind speed: 1.8m/s

set a timer for two minutes thirty seconds

2:19

lyrics bohemian rhapsody

Bohemian Rhapsody

Queen

[Intro]

Is this the real life? Is this just fantasy?

Caught in a landslide, no escape from reality

Open your eyes, look up to the skies and see

Dicio

what's the weather in Trento



Trento

Light rain · 22.3°C

Minimum temperature: 20.9°C

Maximum temperature: 24.8°C

Wind speed: 1.9m/s

set a timer for two minutes thirty seconds

2:18.0

lyrics bohemian rhapsody

Bohemian Rhapsody

Queen

[Intro]

Is this the real life? Is this just fantasy?

Caught in a landslide, no escape from reality

Open your eyes, look up to the skies and see

I'm just a poor boy. I need no sympathy

Because I'm easy com

Any way the wind blows

Dicio

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Here is what I can do!



Weather

What's the weather like in Rome?



Search

Search how to feed a cat



Song lyrics

What's the song that goes we will we will rock y...



App opener

Open NewPipe



Calculator

What is five times four minus a million?



Navigation

Navigate to Vancouver international airport



Telephone

Call Tom



Timer

Set a timer for five minutes



Current time

What time is it?

 Listening...



Imperative vs Declarative

(1) Create initial
view **tree**

(2) Keep tree in
sync with state

UI =

$f(\text{state})$



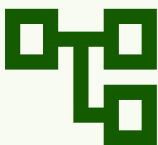
State



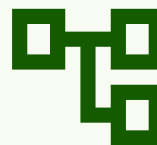
single source of truth



UI is **redrawn/recomposed** when
it changes*



*frameworks perform **diffs** to
make this fast





- ▮ Fewer **state** bugs

- ▮ **Reusability**

- ▮ Less **boilerplate**

And more...

