

LUIS App Exports

These exports can be imported to get the LUIS application used in this work. This can be achieved in the applications overview at <https://www.luis.ai/applications>. After importing, the model must be manually trained and published in LUIS.

Versions

- **0.1:** Intents are trained with machine learned entities and subentities.
- **0.2-features:** Like 0.1 but intents have machine learned entities as ML-Features.
- **0.2-entities:** Like 0.1 but with additional (separate) list and regex entities to help identify intents.
- **0.3:** Combination of 0.2-features and 0.2-entities.
- **0.4:** The list and regex entities are assigned to machine learned entities as ML-Features.

Definition of Version 0.4

Intents






Intent	Features	Utterances
Contact	MLContact	<div>- olympic 072 contact nattenheim 135.4</div> <div>- alitalia 5f contact milano 12585 bye</div> <div>- cross air 269w contact marseille on 125.85 good bye</div> <div>- sabena 4ad contact rhein frequency 132.4 tschuss</div> <div>- air berlin 5081 geneva 13315</div> <div>- air hamburg 2546 marseille</div> <div>- alitalia 401 zurich 134.6</div> <div>- french air force 4234 reims 134.4 good bye</div> <div>- hapag lloyd 355 zurich frequency 1337 tschuss</div> <div>- swissair 9360 contact rhein radar 127.37</div>
FlightLevel	MLFlightLevel	<div>- swiss 806 identified climb now flight level 340</div> <div>- alitalia 851c buongiorno maintain level 320</div> <div>- olympic 087 identified maintain flight level 350</div> <div>- aegean 87h descend now level 300</div> <div>- iberia 3473 bonjour climb to flight level 390</div> <div>- cross air 512 bonjour cleared kines st prex fribourg flight level 310</div> <div>- general motors 4209 continue descent to level 340</div> <div>- lufthansa 4416 climb flight level 290</div> <div>- luxair 2663 bonjour continue climb to flight level 350</div> <div>- united 69 descend to flight level 290</div> <div>- aero lloyd 517 good morning maintain flight level 320</div> <div>- airfrans 3261 climb to flight level 340</div> <div>- bonjour swissair 687 maintain flight level 280</div>
None		<div>- app developers drink coffee</div> <div>- music is categorized into genres</div> <div>- trampolines are mostly played with by kids</div> <div>- penguins are animals</div> <div>- trains on tracks</div>

Intent	Features	Utterances
Squawk	MLSquawk	<div><div>- good evening olympic 2d squawk 6751</div><div>- alitalia 210z squawk 4673</div><div>- swiss 213k good evening squawk 8315</div><div>- good afternoon sabena 63w squawk 1499</div><div>- airfrans 016 bonjour squawk 6784</div><div>- bonjour alitalia 228 squawk 5772</div><div>- air malta 104 good afternoon squawk 5730</div><div>- lufthansa 4356 good morning squawk 2712</div><div>- good morning adria 1642 squawk 2710</div></div>
Turn	MLTurn	<div><div>- lufthansa 6b turn now left to dkb</div><div>- air portugal 41ac turn right 10 degrees</div><div>- aero lloyd 560 further left by 10 degrees</div><div>- alitalia 292 turn right to nattenheim</div><div>- itu 1602 right by 20 degrees please</div><div>- hapag lloyd 171 turn left to bilsa</div><div>- jet set 207 left direct hochwald</div><div>- french lines 9165 fly heading 095</div><div>- lufthansa 5504 turn right heading 200</div><div>- olympic 144 turn left heading 115 for separation</div></div>

Entities

Machine Learned

Entity	Sub-Entity	Feature
MLCallSign		
<div>└─</div>	Model class library used by multiple solutions (C# .NET 5)	ListAirlines
<div>└─</div>	FlightNr	
MLContact		
		ListContactIdentifiers
<div>└─</div>	Frequency	RegexContactFrequency
<div>└─</div>	Place	geographyV2
MLFlightLevel		
<div>└─</div>	Level	RegexFlightLevel
<div>└─</div>	Instruction	ListFlightLevelInstructions
MLSquawk		
<div>└─</div>	Code	RegexSquawkNr
MLTurn		
<div>└─</div>	Direction	ListTurnDirections
<div>└─</div>	Degrees	RegexTurnDegrees
<div> </div>	<div>└─</div> Value	

Entity	Sub-Entity	Feature
	Heading	RegexTurnHeading
	 Value	
	Place	RegexTurnPlace
	 Value	

Regex

- RegexContactFrequency: `(\d){3}(\.)?(\d){2}`
- RegexFlightLevel: `(flight)?level (\d+)`
- RegexSquawkNr: `squawk \d{4}`
- RegexTurnDegrees: `\d{2} degrees`
- RegexTurnHeading: `heading \d{3}`
- RegexTurnPlace: `to (A-Za-z0-9)+`

Lists

- ListAirlines: contains callsigns of airlines from folder `../airlines.json`
- ListContactIdentifiers: `contact`, `frequency`
- ListFlightLevelInstructions: `climb`, `descend` (with `descent` as synonym), `maintain`
- ListTurnDirections: `left`, `right`

Pre-Defined

- `geographyV2` (to find places i.e. in 'contact rhein')