

Práctica 4 – Robots Móviles – Luis Ignacio Viñas Petriz

Ejecutamos el comando `roslaunch bring_up pocketsphinx_test.launch` para utilizar el reconocimiento de voz de Pocketsphinx, en el archivo `voice_cmd.gram` podemos encontrar las frases que puede reconocer la herramienta de Pocketsphinx, las cuales son:

- `public <move> = MOVE FORWARD;`
- `public <move2> = MOVE <direction> [<speed>];`

Donde:

- `direction` puede ser: FORWARD, BACK, LEFT o RIGHT (adelante, atrás, izquierda o derecha)
- `speed` puede ser: FULL SPEED o HALF SPEED (a toda velocidad o la mitad)

Funcionó correctamente Pocketsphinx al reconocer las frases:

```
/home/nacho/MobileRobots-2020-2-For-Covid19/catkin_ws/src/bring_up/launch/robotino_simul.launch http://localhost:11311 x /home/nacho/MobileRobo
INFO: fsg_search.c(869): fsg 0.49 CPU 0.156 xRT
INFO: fsg_search.c(871): fsg 6.23 wall 1.997 xRT
[INFO] [1587627015.444143]: OUTPUT: "MOVE LEFT"
INFO: cmn_live.c(120): Update from < 25.15 -4.62 -6.11 -1.99 -2.70 -4.36 -5.00 0.03 0.87 5.28 2.28 2.86 2.53 >
INFO: cmn_live.c(138): Update to < 26.99 -3.93 -6.50 -1.80 -1.35 -3.42 -5.96 0.14 -1.00 5.43 3.29 1.95 3.19 >
INFO: fsg_search.c(859): 105 frames, 1890 HMMs (18/fr), 5515 senones (52/fr), 744 history entries (7/fr)

INFO: fsg_search.c(869): fsg 0.19 CPU 0.175 xRT
INFO: fsg_search.c(871): fsg 4.76 wall 4.493 xRT
[INFO] [1587627020.212803]: OUTPUT: "MOVE RIGHT"
INFO: cmn_live.c(88): Update from < 26.99 -3.93 -6.50 -1.80 -1.35 -3.42 -5.96 0.14 -1.00 5.43 3.29 1.95 3.19 >
INFO: cmn_live.c(105): Update to < 27.83 -3.27 -5.15 -1.51 -1.37 -4.05 -5.28 0.02 -1.28 6.11 3.37 1.16 3.82 >
INFO: cmn_live.c(120): Update from < 27.83 -3.27 -5.15 -1.51 -1.37 -4.05 -5.28 0.02 -1.28 6.11 3.37 1.16 3.82 >
INFO: cmn_live.c(138): Update to < 27.95 -2.28 -5.16 -2.17 -1.12 -4.12 -5.60 0.02 -1.35 6.37 3.69 1.12 3.93 >
INFO: fsg_search.c(859): 127 frames, 2534 HMMs (19/fr), 7347 senones (57/fr), 885 history entries (6/fr)

INFO: fsg_search.c(869): fsg 0.21 CPU 0.164 xRT
INFO: fsg_search.c(871): fsg 3.45 wall 2.697 xRT
[INFO] [1587627023.668703]: OUTPUT: "MOVE FORWARD"
INFO: cmn_live.c(120): Update from < 27.95 -2.28 -5.16 -2.17 -1.12 -4.12 -5.60 0.02 -1.35 6.37 3.69 1.12 3.93 >
INFO: cmn_live.c(138): Update to < 28.70 -1.92 -4.95 -2.05 -0.34 -3.36 -5.84 0.02 -1.29 6.56 3.56 0.16 4.47 >
INFO: fsg_search.c(859): 125 frames, 2149 HMMs (17/fr), 6412 senones (51/fr), 694 history entries (5/fr)

INFO: fsg_search.c(869): fsg 0.52 CPU 0.415 xRT
INFO: fsg_search.c(871): fsg 29.87 wall 23.708 xRT
[INFO] [1587627053.543294]: OUTPUT: "MOVE BACK"
INFO: cmn_live.c(88): Update from < 28.70 -1.92 -4.95 -2.05 -0.34 -3.36 -5.84 0.02 -1.29 6.56 3.56 0.16 4.47 >
INFO: cmn_live.c(105): Update to < 29.91 -0.89 -3.33 -1.22 -0.01 -3.78 -5.32 -0.22 -1.48 6.54 3.31 -0.71 5.73 >
INFO: cmn_live.c(120): Update from < 29.91 -0.89 -3.33 -1.22 -0.01 -3.78 -5.32 -0.22 -1.48 6.54 3.31 -0.71 5.73 >
INFO: cmn_live.c(138): Update to < 30.45 -1.85 -2.11 -0.26 1.27 -4.14 -5.71 -0.22 -2.22 6.40 3.26 -1.14 5.00 >
INFO: fsg_search.c(859): 196 frames, 2224 HMMs (11/fr), 7666 senones (39/fr), 562 history entries (2/fr)

INFO: fsg_search.c(869): fsg 0.37 CPU 0.190 xRT
INFO: fsg_search.c(871): fsg 14.42 wall 7.318 xRT
[INFO] [1587627067.962323]: OUTPUT: "MOVE FORWARD FULL SPEED"
INFO: cmn_live.c(88): Update from < 30.45 -1.85 -2.11 -0.26 1.27 -4.14 -5.71 -0.22 -2.22 6.40 3.26 -1.14 5.00 >
INFO: cmn_live.c(105): Update to < 32.19 -2.91 -1.99 0.94 3.19 -4.59 -5.45 -1.59 -2.75 8.17 3.74 -2.17 5.22 >
INFO: cmn_live.c(120): Update from < 32.19 -2.91 -1.99 0.94 3.19 -4.59 -5.45 -1.59 -2.75 8.17 3.74 -2.17 5.22 >
INFO: cmn_live.c(138): Update to < 31.92 -2.92 -2.13 0.96 3.14 -4.67 -5.48 -1.57 -2.75 8.10 3.73 -1.99 5.00 >
INFO: fsg_search.c(859): 226 frames, 2392 HMMs (10/fr), 7672 senones (33/fr), 710 history entries (3/fr)

INFO: fsg_search.c(869): fsg 0.32 CPU 0.140 xRT
INFO: fsg_search.c(871): fsg 8.00 wall 3.523 xRT
[INFO] [1587627075.962269]: OUTPUT: "MOVE LEFT HALF SPEED"
INFO: cmn_live.c(120): Update from < 31.92 -2.92 -2.13 0.96 3.14 -4.67 -5.48 -1.57 -2.75 8.10 3.73 -1.99 5.00 >
INFO: cmn_live.c(138): Update to < 32.13 -3.07 -1.47 1.37 4.01 -5.50 -5.85 -1.46 -2.71 8.46 3.53 -1.54 5.37 >
INFO: fsg_search.c(859): 186 frames, 1896 HMMs (10/fr), 6646 senones (35/fr), 696 history entries (3/fr)

INFO: fsg_search.c(869): fsg 0.24 CPU 0.126 xRT
INFO: fsg_search.c(871): fsg 4.05 wall 2.166 xRT
[INFO] [1587627080.016885]: OUTPUT: "MOVE RIGHT FULL SPEED"
```

A continuación, modificaremos el archivo `pocketsphinx_text.launch`, cambiándole sus parámetros:

- `gram`, cambiando `/voice_cmd` a `/restaurant`
- `dict`, cambiando `/voice_cmd` a `/restaurant`
- `grammar`, cambiando `voice_cmd` a `restaurant`
- `rule`, cambiando `move2` a `command`

Por lo que ahora Pocketsphinx ahora reconocerá las frases que vengan en el archivo `restaurant.gram`, las cuales son:

- `<justina> = JUSTINA (YES | NO | WAIT | START | TAKE A ORDER | THIS IS THE ORDER);`
- `<wantCombo> = I WANT [A] (PRINGLES | CHIPS | PASTA | COOKIES | PASTA | NOODLES | TUNA FISH | PICKLES | CHOCO FLAKES | ROBO O'S | MUESLI | M AND M) AND (PRINGLES | CHIPS | PASTA | COOKIES | PASTA | NOODLES | TUNA FISH | PICKLES | CHOCO FLAKES | ROBO O'S | MUESLI | M AND M);`
- `<wantBeverage> = I WANT A (TEA | BEER | COKE | WATER);`

Funcionó correctamente Pocketsphinx al reconocer las frases:

```
Archivo  Editar  Ver  Buscar  Terminal  Pestañas  Ayuda
/home/nacho/MobileRobots-2020-2-for-Covid19/catkin_ws/src/bring_up/launch/robotino_simul.launch http://localhost:11311 * /home/nacho/MobileR
NFO: fsg_search.c(871): fsg 6.23 wall 5.325 xRT
INFO [1587628953.511357]: OUTPUT: "JUSTINA WAIT"
NFO: cmn_live.c(120): Update from < 39.37 -2.93 -1.72 -4.52 7.99 -2.69 -4.31 -2.52 -3.51 8.71 2.82 -2.31 2.65 >
NFO: cmn_live.c(138): Update to < 39.79 2.60 -1.94 -6.47 -0.01 -1.82 -2.47 -3.96 -5.84 6.09 4.72 -2.43 6.60 >
NFO: fsg_search.c(859): 253 frames, 5932 HMMs (23/fr), 17083 senones (67/fr), 1284 history entries (5/fr)

NFO: fsg_search.c(869): fsg 0.39 CPU 0.152 xRT
NFO: fsg_search.c(871): fsg 5.97 wall 2.349 xRT
INFO [1587628959.478959]: OUTPUT: "I WANT ROBO O'S AND PASTA"
NFO: cmn_live.c(120): Update from < 39.79 2.60 -1.94 -6.47 -0.01 -1.82 -2.47 -3.96 -5.84 6.09 4.72 -2.43 6.60 >
NFO: cmn_live.c(138): Update to < 39.74 3.53 -2.80 -4.31 2.53 -1.26 -2.59 -4.53 -5.13 5.63 5.47 -2.35 4.11 >
NFO: fsg_search.c(859): 166 frames, 5988 HMMs (36/fr), 14850 senones (89/fr), 1355 history entries (8/fr)

NFO: fsg_search.c(869): fsg 0.26 CPU 0.157 xRT
NFO: fsg_search.c(871): fsg 4.54 wall 2.721 xRT
INFO [1587628964.025636]: OUTPUT: "I WANT A BEER"
NFO: cmn_live.c(88): Update from < 39.74 3.53 -2.80 -4.31 2.53 -1.26 -2.59 -4.53 -5.13 5.63 5.47 -2.35 4.11 >
NFO: cmn_live.c(105): Update to < 41.55 3.63 -2.39 -3.63 5.31 0.72 -0.83 -6.59 -6.74 5.78 6.26 -2.74 3.67 >
NFO: cmn_live.c(120): Update from < 41.55 3.63 -2.39 -3.63 5.31 0.72 -0.83 -6.59 -6.74 5.78 6.26 -2.74 3.67 >
NFO: cmn_live.c(138): Update to < 39.88 2.43 -2.57 -3.39 4.95 0.29 -1.42 -5.64 -6.14 5.19 6.36 -2.66 3.38 >
NFO: fsg_search.c(859): 310 frames, 8217 HMMs (26/fr), 23265 senones (75/fr), 1672 history entries (5/fr)

NFO: fsg_search.c(869): fsg 0.44 CPU 0.140 xRT
NFO: fsg_search.c(871): fsg 5.46 wall 1.756 xRT
INFO [1587628969.489149]: OUTPUT: "I WANT COOKIES AND MUESLI"
NFO: cmn_live.c(88): Update from < 39.88 2.43 -2.57 -3.39 4.95 0.29 -1.42 -5.64 -6.14 5.19 6.36 -2.66 3.38 >
NFO: cmn_live.c(105): Update to < 40.14 2.25 -3.16 -1.94 5.91 0.09 -1.15 -5.88 -5.79 6.51 5.58 -2.37 4.37 >
NFO: cmn_live.c(120): Update from < 40.14 2.25 -3.16 -1.94 5.91 0.09 -1.15 -5.88 -5.79 6.51 5.58 -2.37 4.37 >
NFO: cmn_live.c(138): Update to < 39.28 0.72 -0.78 -2.70 2.95 0.06 -0.71 -5.27 -5.66 5.35 4.70 -2.50 4.45 >
NFO: fsg_search.c(859): 345 frames, 7291 HMMs (21/fr), 22437 senones (65/fr), 1651 history entries (4/fr)

NFO: fsg_search.c(869): fsg 0.52 CPU 0.151 xRT
NFO: fsg_search.c(871): fsg 8.72 wall 2.522 xRT
INFO [1587628978.217327]: OUTPUT: "I WANT TUNA FISH AND ROBO O'S"
NFO: cmn_live.c(88): Update from < 39.28 0.72 -0.78 -2.70 2.95 0.06 -0.71 -5.27 -5.66 5.35 4.70 -2.50 4.45 >
NFO: cmn_live.c(105): Update to < 39.70 1.45 -1.37 -1.60 3.66 0.55 -1.08 -6.47 -6.47 6.45 4.62 -2.07 5.57 >
NFO: cmn_live.c(120): Update from < 39.70 1.45 -1.37 -1.60 3.66 0.55 -1.08 -6.47 -6.47 6.45 4.62 -2.07 5.57 >
NFO: cmn_live.c(138): Update to < 38.80 1.45 -1.70 -1.75 3.34 0.54 -1.28 -5.95 -6.00 6.25 4.48 -2.02 5.37 >
NFO: fsg_search.c(859): 225 frames, 2041 HMMs (9/fr), 8325 senones (37/fr), 463 history entries (2/fr)

NFO: fsg_search.c(869): fsg 0.37 CPU 0.164 xRT
NFO: fsg_search.c(871): fsg 9.46 wall 4.185 xRT
INFO [1587628987.680170]: OUTPUT: "JUSTINA WAIT"
NFO: cmn_live.c(120): Update from < 38.80 1.45 -1.70 -1.75 3.34 0.54 -1.28 -5.95 -6.00 6.25 4.48 -2.02 5.37 >
NFO: cmn_live.c(138): Update to < 37.21 -1.59 -2.02 -1.74 2.76 -0.34 -1.80 -4.25 -5.45 5.51 5.12 -2.39 5.07 >
NFO: fsg_search.c(859): 78 frames, 1367 HMMs (17/fr), 3577 senones (45/fr), 375 history entries (4/fr)

NFO: fsg_search.c(869): fsg 0.12 CPU 0.154 xRT
NFO: fsg_search.c(871): fsg 2.12 wall 2.686 xRT
RROR: "fsg_search.c", line 940: Final result does not match the grammar in frame 78
NFO: cmn_live.c(120): Update from < 37.21 -1.59 -2.02 -1.74 2.76 -0.34 -1.80 -4.25 -5.45 5.51 5.12 -2.39 5.07 >
NFO: cmn_live.c(138): Update to < 36.55 -3.78 -2.38 -2.03 2.54 -0.46 -2.28 -3.75 -4.96 5.09 5.42 -2.29 4.72 >
NFO: fsg_search.c(859): 69 frames, 1139 HMMs (16/fr), 3061 senones (44/fr), 330 history entries (4/fr)
```