

MiniMech: The Smartphone-controlled Avatar That Says What You Type

MiniMech is a small indoor robot toy whose movement you can control by physically moving a smartphone running the MiniMech app. MiniMech can also speak! When you switch him from **move-mode** to **talk-mode** (by firmly jerking the phone downwards), MiniMech will choose one of 10 phrases to say, that you have typed into the app on startup. To return MiniMech to **move-mode**, simply jerk the phone downwards again and move him along.

MiniMech is very easy to use:

- 1) On startup of the app, wait for MiniMech to pair with your phone via Bluetooth. Once MiniMech's light switches from red to green, MiniMech is ready to hear from you.
- 2) Once paired, type in up to 10 phrases you would like MiniMech to say. Hit '**Done**' when you are done.
- 3) To change modes, jerk the phone firmly downwards – this will put MiniMech into **move-mode**, and his blue light should activate. To move MiniMech, tilt the phone forwards or backwards. To turn MiniMech, tilt the phone back to centre – his light should switch from blue to orange. Tilt your phone left or right to steer MiniMech in the direction you would like him to go next. Then tilt the phone forwards or backwards again, watch his light return to green and off he will go.
- 4) To enter **talk-mode**, jerk the phone downwards again: MiniMech's light will change back to green, he will stop, wait two seconds, then choose one of his phrases to say.
- 5) To re-enter **move-mode**, jerk the phone downwards again.

MiniMech is an entertaining way to interact with family members, friends, even pets. MiniMech can also provide some entertaining companionship for anyone housebound alone. And with two MiniMechs available to interact with each other, all kinds of fun and games can happen!

Tech Specs:

- Power:
 - Source: 9V battery. Microcontroller, Bluetooth module, text-to-speech module all run at 3.3V. Audio amplifier, wheel motor drive run at 9V.
 - max power usage: 1W, 111mA.
- Bluetooth: 2.4GHz, sensitivity: -80dBm, adaptive frequency hopping. Range: up to 9m.
- Software: MiniMech apps for Android and iOS.
- Text-to-Speech: English, Chinese. Unicode format, 4Kb max per synthesis.

Components:

Purpose	Product	Price	Link
Central processor	STM32f407VGT6	\$19.39	https://www.digikey.com.au/product-detail/en/stmicroelectr

			onics/STM32F407VGT6/497-11605-ND/2747117
Audio amplifier	LM4902 Boomer	\$1.83	https://au.mouser.com/ProductDetail/Texas-Instruments/LM4902M-M-NOPB?qs=QbsRYf82W3GZV%252Bp4rEknXg%3D%3D
Speaker	Kitronik Thin Speaker	\$3.29	https://www.cdsoft.com.au/p/9347555/kitronik-025w-8-ohm-40mm-thin-speaker.html?gclid=Cj0KCQjwhT1BRCiARIsAGIY51II13geLkUSXmcrTYEjhm1srKZd5v8ww1y5zeFREgokMsUfdxyPVE0aAqE EALw wcb
Text-to-speech module	XFS5152	\$25.33	https://www.banggood.com/buy/xfs5152-speech-synthesis-module.html
Bluetooth receiver	HC-06	\$13.20	https://core-electronics.com.au/bluetooth-module-hc-06.html
Wheels	Arduino DC Motor Wheels with Rubber Tyres	\$20.68	https://www.auselectronicsdirect.com.au/arduino-dc-motor-with-wheel-and-rubber-tyres?gclid=Cj0KCQjwhT1BRCiARIsAGIY51KGpQ7v9pTZSFbSXk-Ywb8Ze-jXIDTRIW49JF3457xXdIIAkJH6sjYaAhd1EALw wcb
Step-up DC motor Driver (boost digital PWM signal from STM32f407VGT6 Microcontroller)	L293D	\$6.66	https://core-electronics.com.au/dual-h-bridge-motor-driver-for-dc-or-steppers-600ma-l293d.html

Step-down voltage regulator for 3.3V components	STM32f407VGT6	\$0.83	https://au.element14.com/on-semiconductor/ncp1117st33t3g/ic-linear-voltage-regulator/dp/1652366?gclid=Cj0KCQjwhtT1BR_CiARIsAGIY51Lv3KniuwDTKHGokpdQbB3E7YtsNQQwDDyBRfWZRZudXp0Xc6t2J1IaAm2FEALw_wcB&mckv=s_dc pcrid 432287894049 pkw pmt slid product 1652366 pgrid 102205442564 ptaid pla-900340836160 &CMP=KNC-GAU-GEN-SHOPPING-SEMICONDUCTOR-ICS
		TOTAL: \$91.21	