DeCAIR:
Developing Curricula for Artificial Intelligence and Robotics

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أجهزة حاسوب وروبوتات وأدوات صفية

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- The following table specifies the quantities that should be installed in each of the following universities:
    - UJ: The University of Jordan
    - JUST: Jordan University of Science and Technology
    - TTU: Tafila Technical University
- Ordered quantities can be adjusted to fit the allocated budget.
- All equipment in this tender are exempt from customs duties and other taxes, including the general sales tax. Therefore, the prices offered must not include customs duties and the general value-added sales tax (VAT).
- The selection criterion is based on the offers of best specifications that are within the allocated budget.
- Partial award is possible.
- The specifications of these items are in the following pages using the Item No. as the reference number.

Equipment List

Item No	University	Item	QTY	Estimated Cost in €
1	UJx2, TTUx1	High-end workstations (many cores and with GPUs)	3	35,500
2	UJx16, JUSTx2, TTUx13	Personal computers with GPUs	31	31,000
3	UJx2, JUSTx2, TTUx2	Laptops for teaching purposes	6	6,000
4.1-4.3	UJx2	Smartboards, Data show and Conference Camera for classrooms	2	4,380
5	UJx1	Robotic manipulator	1	16,000
6	UJx1	Autonomous ground robot	1	11,000
7	UJx1	Autonomous air drone	1	17,000
8	UJx1	Ground control station	1	6,000
9	JUSTx1	2-DoF Control Platform (Ball balancing table)	1	6,000
10	JUSTx1	3-DoF Vision Guided Parallel Manipulator Platform (Delta Robot)	1	6,000
11	JUSTx2	Advanced Differential Drive Mobile Robot with camera on-board	2	13,000
12	JUSTx4	Differential Drive Mobile Robot	4	4,000
13	JUSTx3	Unmanned Aerial Vehicle (UAV)	3	3,210
14	TTUx10	Development kit for AI at the Edge (Jetson Nano Developer Kit)	10	1,000
15	TTUx4	Development kit for AI at the Edge (Jetson Carrier Boards)	4	1,000
16	TTUx5	Development kit for AI at the Edge (NVIDIA Jetson Xavier NX Developer Kit)	5	2,000
17	TTUx5	Development kit for AI at the Edge (NVIDIA Jetson AGX Xavier Dev. Kit)	5	3,000
18	TTUx10	CSI Camera module (Raspberry Pi CSI Camera)	10	400
19	TTUx10	Development board for Machine learning (Google Coral Dev. Board)	10	2,600
20	TTUx1	6-axis Industrial Robot Arm (6-digree of freedom)	1	3,000
21	TTUx2	Humanoid Robot	2	5,000
22	TTUx2	Unmanned Aerial Vehicle (UAV) Equipment kit	2	2,000
23	TTUx4	Unmanned Ground Vehicle (UGV) Equipment kit	4	1,000
24	TTUx8	JetBot AI Robot Platform	8	2,490
		Total		**182,580**

Specifications

- All the following specifications should be considered as minimum required specifications.
- When a specific brand is specified, a compatible or equivalent equipment can be offered.

➢ Item No. 1: High-end workstation (many cores and with GPUs)	
Model	• Well-known brand • Main system unit, monitor, mouse and keyboard must carry the same brand name
Processors	2 x Intel Xeon Gold 6226R with (2.9 GHz /16- core /22MB cache)
Chipset	Intel C624 chipset
Installed memory	192 (3x64) GB DDR4-2933 registered ECC, expandable up to 1TB
Internal storage	2x 1TB SSD M.2 drive
Graphics card	2xNVIDIA Quadro RTX 5000, 16GB
Monitor	Min 27" QHD monitor with DP Port
Optical drive	Internal DVD writer drive
Networking	2x Integrated 10/100/1000 Mbps Ethernet port WLAN 802.11ac (2x2) PCIe and BT5
I/O ports	Min 6 USB (at least 4xUSB 3.1 of them) 1x audio out, 1x audio in
Slots	Min 6 PCIe
Operating system	No OS
Other	Bidder must be a listed partner with the mother company, certificate must be provided Bidder must have an official service center, certificate must be provided
Service & support	3 years (parts and labor) onsite warranty from manufacturer (prove must be provided)

➢ **Item No. 2: Personal computer with GPU**	
Model	Well-known brand name
Manufacturing requirements	• Main system unit, monitor, mouse and keyboard must carry the same brand name • Tower case (mini or micro)
Processor	Intel Core i7-10700 (2.9 GHz base frequency, 16MB cache, 8 cores)
Chipset	Q Chipset
Memory	8GB DDR4, upgradable
Storage	512GB SSD M.2
USB ports	6 ports, including 2 USB3.0 ports
Expansion slots	Min 2x PCIe x 16
Network interface	Gigabit Ethernet R45 LAN, wireless
Graphics	NVIDIA® 2GB GDDR5 with HDMI, VGA, or DP port Compute capability 3.5
Pointing device type	USB mouse, optical, wheel with mouse pad
Keyboard	USB A/L keyboard
Monitor	21" LED, HDMI, VGA, or DP port The connection must be direct between the monitor and PC without any converter
Monitor Cable	Suitable Cable
Audio	High definition, integrated sound system
Power	220v, 50Hz AC power with MK cable
Operating system	Free DOS
Drivers, utilities & documentation	All drivers that support the system, original documentation manuals, setup utilities for installation and usage should be provided as sent by manufacturer
Other	Bladder must be a listed partner with the mother company, certificate must be provided Bidder must have an official service center, certificate must be provided
Warranty	3 years (parts and labor) onsite warranty from manufacturer (prove must be provided)

➢ **Item No. 3: Laptop for teaching purposes**	
Processor (CPU)	10th generation Intel core i7-1165G7 (2.8 GHz, up to 4.7 GHz, 12MB cache, 4 cores)
Chipset	Intel chipset is integrated with processor
RAM	8GB (1x8GB) DDR4-2666 expandable to 16GB
Hard disk	512GB SSD M.2
Display adapter	2GB RAM dedicated Nvidia GPU with compute capability of 3.5
Monitor	15.6" LED backlit FHD
Ports	- Network connector (RJ45) - Minimum 2 x USB 3.0 - Headphone/Microphone - HDMI
Communications	- 10/100/1000 Gigabit Ethernet - Wireless 802.11a/b/g/n - Bluetooth
Sound card & speakers	Integrated sound card with internal speakers
Keyboard & input device	Integrated A/L keyboard with touchpad pointing device
Camera	Integrated
Battery	3-cell battery
AC power adapter	AC adapter with MK power cord
Carrying case	Yes
Operating system	Free DOS
Others	Bladder must be a listed partner with the mother company, certificate must be provided Bidder must have an official service center, certificate must be provided
Warranty	3 years (parts and labor) onsite warranty from manufacturer (prove must be provided)

➢ Item No. 4.1: Smart Board

Touch and control method	Finger or any Object
Active area size	>88''
Input method	infrared
Electronic free surface	Durable electronic free screen
Reflection & glare	Very low reflection, very low glare
Surface	Hard surface
Hand writing recognition	Multiple languages including Arabic and English
Object management	Allow to create, move and resize all your objects to present a changing situation
Connectivity	USB with supplied 10m USB cable; wireless
Training	Training and knowledge transfer on site
Warranty and support	One year

➢ Item No. 4.2: Data Show

Component		Specification
Resolution		≥WXGA (1280x800)
Display	Technology	LCD
	Brightness	≥3000 ANSI Lumens
	Projection Distance	60-150" diagonal display size
Contrast Ratio		≥10000:1
Inputs		2x15-Pin Mini D-sub
		1xRCA
		2xHDMI
		Stereo, RCA (L/R)
Outputs		1x15-Pin Mini D-sub
Lamp life		5000-10000 Hours
Speakers		>15 W
Ceiling Mount Kit and installation		Yes
HDMI Cable 10m		Yes
Complete Installation with all Necessary Cables		

➢ Item No. 4.3: Conference Camera for classroom

	• Total Zoom 8X or more • Full HD 1080p • Full duplex speakerphone and noise & Echo –cancelling microphone • Plug and Play USB connectivity to Windows, Mac • Compatibility with Skype and Google Hangouts • Remote control and base button control option • Necessary cables • Wall mount kit

Item No. 5: Robotic Manipulator	
Weight	8.25 kg
Payload	350-750 g
Reach	750 mm
Repeatability	± 0.05 mm
Camera	Intel® RealSense™ D415
Interface	USB (QFLEX 2)
Interface control modes	Position mode, Current mode
External control rate	500 Hz
Expandable I/O	PWM/Analog/I²C/SPO/UART
Minimum and maximum joint range	Base: ±170° Shoulder: ± 85° Elbow: -95°/+75° Wrist: ± 160°
Maximum joint speed	± 90°/s
System Specifications	4 DOF robot manipulator: 4-axis robot with two-finger gripper - Extensive data acquisition and control capability - Easy integration with third-party sensors and actuators - Highly-flexible operation and control design using MATLAB®/Simulink® and control software - Fully documented system models and parameters - Open architecture design, allowing users to design their own controller - Lightweight and robust design using carbon fiber design

	Item No. 6: Autonomous ground robot	

Robot diameter	~35 cm
Robot height (with Kinect mounted)	~27 cm
Maximum linear speed	0.7 m/s
Available payload	App. 4.5 kg
Battery life	Maximum 3 hours
On-board computer	Raspberry Pi™ with integrated WiFi
Camera resolution	640 x 480
Depth sensing	11 bit
Depth sensor range	0.5 - 6 m
On-board sensors	3 digital bump sensors 2 digital wheel drop sensors 3 cliff sensors 1 3-axis gyroscope 2 analog motor current sensors 1 Z-axis angle measurement (heading) 2 multi-color programmable LEDs 2 wheel encoders 3 digital buttons 2 over current sensors 1 battery voltage sensor 1 Kinect RGBD sensor 1 charger 1 speaker
I/O channels	28 reconfigurable digital I/O channels, including: 1 SPI bus channel 1 I²C serial bus channel 2 PWM output channels 1 UART serial port (interface 3.3 V serial device)
Connectivity	4 USB 2.0 host ports 1 MIPI DSI display port for touch screen 1 gigabit Ethernet port 1 MIPI CSI camera port
System Specifications	- Autonomous ground robot, built on a 2-wheel mobile platform. - Equipped with built-in sensors, a vision system - Open-architecture control structure that allows users to add other off-the-shelf sensors and customize the robot for their research.

	Item No. 7: Autonomous air drone	

Dimensions	40 x 40 x 15 cm
Weight (with batteries)	~1000 g
Max Payload	~300 g
Power	3S 11.1V LiPo (3300mAh) with XT60 connector
Flight time	~11 minutes for hover per battery charge
On board Computer	Intel® Aero Compute Board (powered by a quad-core Intel Atom® processor) Quad-core 64-bit 2.56 GHz processor , 4 GB LPDDR3-1600 RAM
Expandable I/O:	• PWM (8x) • UART (2x) • SPI (3x SS pins) • I²C • ADC (4x) • Encoder Input (3x) • CPU GPI0 (5x)

Cameras
     Intel® RealSense™ (R200)
       Omnivision OV7251
	• Intel® Aero Vision Accessory Kit
	 • Depth sensing (3-4 metre range)
	 • Vision (640x480 @ 60 FPS or 1080p @ 30FPS)
	 • VGA (640x480 @ 120 FPS)

System Specifications	• The autonomous air vehicle is a midsized quadrotor equipped with a powerful on-board processor and two high-speed, high-resolution cameras enable high-quality on-board video processing, as well as streaming for real-time monitoring. • Impact-resistant carbon fiber frame.

	Item No. 8: Ground control station

	• High performance computer: Intel® Core i7 • 32 GB DDR4 RAM • Three monitors • USB flight controller joystick • High performance router • Battery chargers • Protective net and Protective floor tiles

	Item No. 9: 2-DoF Control Platform (Ball balancing table)

	• Completely assembled and ready to control plant with the integrated power unit • Implementation of advanced digital control techniques • Fully compatible with MATLAB®/Simulink®, LabVIEW™ • Complete documentation such as: system models and parameters provided for MATLAB®/Simulink®, LabVIEW™, and curriculum • Ball position feedback using a high precision touch surface (camera-based feedback optional) • Actuating the table by RC servo motors • Allows students to create their own real-time algorithms. • Open architecture with extensive courseware

➢ Item No. 10: 3-DoF Vision Guided Parallel Manipulator Platform (Delta Robot)	
	• Completely assembled and ready to control plant with integrated camera and controller • Implementation of advanced digital control, robotic and machine vision techniques • Fully compatible with MATLAB®/Simulink® and LabVIEW™ • Complete documentation such as: system models and parameters provided for MATLAB®/Simulink®, LabVIEW™, and curriculum • Magnetic and stylus end-effector options for Pick and Place and touch applications • Optional tablet add-on for digital factory applications • Allows students to create their own real-time vision guided robotic algorithms • Actuating the manipulator by RC servo motors • Open architecture with extensive courseware

➢ **Item No. 11:** **Advanced Differential Drive Mobile Robot with camera on-board**	
Platform	Simple Differential Drive Mobile Robot.
Number of Wheels	2
Robot Diameter	35 cm
Height with camera mounted	27 cm
Battery life	3 hours
Linear speed	>= 0.7 m/s
Payload	4.5 Kg
Sensors on board	3 digital bumper sensors 2 digital wheel drop sensors 3 analog and digital cliff sensors 3-axis gyroscope 2 wheel encoder inputs 2 wheel speed outputs 2 programmable LED outputs 4 digital power enable outputs 2 analog motor current inputs 3 digital buttons 2 overcurrent sensors 1 Z-axis angle measurement (heading) 1 battery voltage sensor 1 Kinect RGBD sensor
Additional I/O channels	1 SPI bus channel 1 UART serial port (interface 3.3 V serial device) 1 I²C serial bus channel 4 USB 2.0 host ports 1 Gigabit Ethernet 1 5.0 VDC 1 3.3 VDC 1 MIPI CSI camera port 1 MIPI DSI display port for touch screen
On-board computer	Raspberry Pi with integrated WiFi
Sample rate	1000 Hz
Camera Resolution	640 x 480
Depth sensing	11 bit
Depth sensor range	0.5-6 meters
Others	• Low power on-board computer with Linux operating system for high-level, real-time. decision making and task execution. • Mounting holes. • Adjustable camera. • Easy integration of additional elements. • Curriculum with independent exercises for robotics and mechatronics courses.

➢ **Item No. 12: Differential Drive Mobile Robot**

Functional Requirements	- Maximum translational velocity: 70 cm/s - Maximum rotational velocity: 180 deg/s (>110 deg/s gyro performance will degrade) - Payload: 5 kg (hard floor), 4 kg (carpet) - Cliff: will not drive off a cliff with a depth greater than 5cm - Threshold Climbing: climbs thresholds of 12 mm or lower - Rug Climbing: climbs rugs of 12 mm or lower - Expected Operating Time: 3/7 hours (small/large battery) - Expected Charging Time: 1.5/2.6 hours (small/large battery) - Docking: within a 2mx5m area in front of the docking station
Hardware Specifications	- PC Connection: USB or via RX/TX pins on the parallel port - Motor Overload Detection: disables power on detecting high current (>3A) - Odometry: 52 ticks/enc rev, 2578.33 ticks/wheel rev, 11.7 ticks/mm - Gyro: factory calibrated, 1 axis (110 deg/s) - Bumpers: left, center, right - Cliff sensors: left, center, right - Wheel drop sensor: left, right - Power connectors: 5V/1A, 12V/1.5A, 12V/5A - Expansion pins: 3.3V/1A, 5V/1A, 4 x analog in, 4 x digital in, 4 x digital out - Audio: several programmable beep sequences - Programmable LED: 2 x two-coloured LED - State LED: 1 x two coloured LED [Green - high, Orange - low, Green & Blinking - charging] - Buttons: 3 x touch buttons - Battery: Lithium-Ion, 14.8V, 2200 mAh (4S1P - small), 4400 mAh (4S2P - large) - Firmware upgradeable: via USB - Sensor Data Rate: 50Hz - Recharging Adapter: Input: 100-240V AC, 50/60Hz, 1.5A max; Output: 19V DC, 3.16A - Netbook recharging connector (only enabled when robot is recharging): 19V/2.1A DC - Docking IR Receiver: left, center, right - Diameter: 351.5mm / Height : 124.8mm / Weight : 2.35kg (4S1P - small)
Software Specifications	- C++ drivers for Linux and windows - ROS node - Gazebo Simulation

➢ **Item No. 13: Unmanned Aerial Vehicle (UAV)**	
Drone	Size folded: 244x67x65mm Size unfolded: 175x240x65mm Weight: 320g Max transmission range: 4km with controller Max flight time: 25 min Max horizontal speed: 15m/s (55km/h) Max vertical speed: 4m/s Max wind resistance: 50km/h Service ceiling: 4500m above sea level Operating Temperature range: -10°C to 40°C Satellite Positioning Systems: GPS & GLONASS
Battery	Type: High Density Lipo (2 cells) Battery capacity: 2700mAh Battery life: 25 min Charging port: USB-C Voltage: 7.6V WMax Charging power: 24W
Controller	Size folded: 94x152x72mm Size unfolded: 153x152x116mm Weight: 386g Transmission system: Wi-Fi 802.11a/b/g/n Operating frequency: 2.4 - 5.8 GHz Max transmission range: 4km Live streaming resolution: HD 720p Battery capacity: 2500mAh 3.6V Battery life: 2h30 (Android) / 5h30 (iOS) Supported mobile devices: screen size up to 6'' USB ports: USB-C (Charge), USB-A (Connection)
Imaging System	Sensor: 1/2.4'' CMOS LENS: ASPH (Low-dispersion aspherical lens) Aperture: f/2.4 Focal length (35mm format equivalent): 23-69mm (photo), 26-78mm (video) Depth of field: 1.5m - ∞ Shutter speed: electronic shutter 1 to 1/10000s ISO range: 100-3200
Video Resolution	4K Cinema 4096x2160 24fps 4K UHD 3840x2160 24/25/30fps FHD 1920x1080 24/25/30/48/50/60fps Video HFOV: 69° Max video bitrate: 100 Mbps Video format: MP4 (H264)
Digital Zoom	Lossless: up to 2.8x (FHD) & 1.4x (4K) Standard: up to 3x (4K Cinema, 4K UHD, FHD)
Photo Resolution	Wide: 21MP (5344x4016) / 4:3 / 84° HFOV Rectilinear: 16MP (4608x3456) / 4:3 / 75.5° HFOV Photo formats: JPEG, Adobe DNG (RAW) HDR: 4K UHD video
Image Stabilization	Stabilization: 3-axis hybrid Mechanical: 2-axis Roll/Tilt angles Electronic (EIS): 3-axis Roll/Pan/Tilt angles Controllable tilt range: - 90° to +90° (180° total)

Item No. 14: Development kit for AI at the Edge (Jetson Nano Developer Kit)

GPU	128-core NVIDIA Maxwell™ architecture-based GPU
CPU	Quad-core ARM® A57
Video	4K @ 30 fps (H.264/H.265) / 4K @ 60 fps (H.264/H.265) encode and decode
Camera	MIPI CSI-2 DPHY lanes, 12x (Module) and 1x (Developer Kit)
Memory	4 GB 64-bit LPDDR4; 25.6 gigabytes/second
Connectivity	Gigabit Ethernet
OS Support	Linux for Tegra®
Module Size	70mm x 45mm
Developer Kit Size	100mm x 80mm

Item No. 15: Development kit for AI at the Edge (Jetson Carrier Boards)

	• Support smart camera applications • Compatible with Jetson Nano, TX2 NX, and Xavier NX modules • PoE PD (NGX002) capable, power via separate input or over Ethernet (IEEE 802.3af-2003 and IEEE 802.3at2009 compatible) • 1 x GbE, 1x NVMe (M.2 M-Key), 1 microSD, 4x GPIO, I2C, USB Console/UART, USB OTG for programming

Item No. 16: Platform for AI at the Edge (NVIDIA Jetson Xavier NX Developer Kit

AI Performance	21 TOPS
GPU	384-core NVIDIA Volta™ GPU with 48 Tensor Cores
CPU	6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6MB L2 + 4MB L3
Memory	8 GB 128-bit LPDDR4x 51.2GB/s
Storage	16 GB eMMC 5.1
Power	10 W|15 W
PCIe	1 x1 (PCIe Gen3) + 1 x4 (PCIe Gen4), total 144 GT/s*
CSI Camera	Up to 6 cameras (24 via virtual channels) 14 lanes (3x4 or 6x2) MIPI CSI-2 D-PHY 1.2 (up to 30 Gbps)
Video Encode	2x 4Kp30 | 6x 1080p60 | 14x 1080p30 (H.265 & H.264)
Video Decode	2x 4Kp60 | 4x 4Kp30 | 12x 1080p60 | 32x 1080p30 (H.265) 2x 4Kp30 | 6x 1080p60 | 16x 1080p30 (H.264)
Display	2 multi-mode DP 1.4/eDP 1.4/HDMI 2.0
DL Accelerator	2x NVDLA Engines
Vision Accelerator	7-Way VLIW Vision Processor
Networking	10/100/1000 BASE-T Ethernet
Mechanical	69.6 mm x 45 mm 260-pin SO-DIMM connector

➤ Item No. 17: Platform for AI at the Edge (Jetson AGX Xavier Module)

GPU	512-core Volta GPU with Tensor Cores
CPU	8-core ARM v8.2 64-bit CPU, 8MB L2 + 4MB L3
Memory	32GB 256-Bit LPDDR4x | 137GB/s
Storage	32GB eMMC 5.1
DL Accelerator	(2x) NVDLA Engines
Vision Accelerator	7-way VLIW Vision Processor
Encoder/Decoder	(2x) 4Kp60 | HEVC/(2x) 4Kp60 | 12-Bit Support
Size	105 mm x 105 mm x 65 mm

➤ Item No. 18: CSI Camera module (Raspberry Pi CSI Camera)

Output	RAW12/10/8, COMP8
Back focus	Adjustable (12.5 mm–22.4 mm)
Lens standards	C-mount, CS-mount (C-CS adapter included)
IR cut filter	Integrated
Ribbon cable length	200 mm
Tripod mount	1/4"-20
Size	105 mm x 105 mm x 65 mm
Others	Sony IMX477R stacked, back-illuminated sensor, 12.3 megapixels, 7.9 mm sensor diagonal, 1.55 μm × 1.55 μm pixel size

➤ Item No. 19: Development board for Machine learning (Google Coral Dev. Board)

CPU	NXP i.MX 8M SOC (quad Cortex-A53, Cortex-M4F)
GPU	Integrated GC7000 Lite Graphics
Coprocessor	Google Edge TPU
RAM	1GB LPDDR4
Flash memory	8GB eMMC
Connectivity	Wi-Fi 2x2 MIMO (802.11b/g/n/ac 2.4/5GHz) Bluetooth 4.1
Dimensions	48 x 40 x 5mm

➤ Item No. 20: 6-axis Industrial Robot Arm (6-digree of freedom)

- 6-Axis Freedom, Same as Typical Industrial Robot.
- Three dimensional working space allows tilt and turn -- same to a real industrial robot
- Pre-assembled Device
- High Precise with 0.1-0.2mm Repeatability.
- stepping motor joints with multistage gearbox
- A Multifunctional Extension Module must be included which allows the robot communicating directly with WIFI, BT Bluetooth and RS485 protocols
- Collision detection sensors
- Open-Sourced Hardware
- PC Software must be included, and other control methods such as mobile app or wireless control is preferred.

➢ **Item No. 21:** **Humanoid Robot**	
	• Fully programmable Educational robot • HD Camera • At least 16 degrees of freedom • Dual IPS LCD screen • At 14 servo motors • Different sensors • Gyroscope • 4 microphones • Stereo sound • Windows PC / iOS and Android tablet programmable • Communication kit

➢ **Item No. 22:** **Unmanned Aerial Vehicle (UAV) Equipment kit**	
	• Auto take off & landing • Low battery protection • Failsafe protection • Vision Positioning System • 720p or more HD video transmission • 5 or more megapixel photos • At least 13-minute flight time • Precise hovering • Program a swarm of drones • Mission pads for multiple uses • Multiple flight modes • Special development kit (SDK) • Programmable

➢ **Item No. 23:** **Unmanned Ground Vehicle (UGV) Equipment kit**	
	• Must be Autonomous, open-source robot platform. • It can be used as an educational purpose. • High capabilities controller with powerful processor and at least 3GB of RAM • 4-wheels mobile platform containing 4 DC motors with encoders • RGBD camera • LIDAR A3 laser scanner • inertial sensor (accelerometer + gyro) • time-of-flight distance sensor • at least 3 x 3500 mAh Li-Ion batteries with protection circuits • rear panel providing controls and interfaces for additional modules • high profile alloy wheels • wireless communication capability • robust

➤ Item No. 24: JetBot AI Robot Platform	
JetBot AI robot kit (4 Items)	• SparkFun JetBot AI Robot Kit • Powered by NVIDIA Jetson Nano • Based on the open-source NVIDIA JetBot • Includes: NVIDIA Jetson Nano Developer Kit, JetBot Chasis, MicroSD card with SparkFun JetBot image, wide angle camera & ribbon cable, WiFi Adapter, Motor Driver, Micro OLED Breakout, and Lithium Ion Battery Pack.
JetBot AI robot kit (4 Items)	• Seeedstudio JetBot Smart Car • Powered by NVIDIA Jetson Nano • Based on the open-source NVIDIA JetBot • Includes: NVIDIA Jetson Nano Developer Kit, 8MP camera, Intel Dual Band Wireless, Dual frequency antenna, robot chassis, TT motor, wheels and universal wheel, motor drive board, OLED display, TF card, and Lithium Ion Battery Pack.