INTRODUCTION TO AI & ROBOTICS: A 50-MINUTE EXPERIENCE

Hands-On Demonstration with DJI RoboMaster EP Core

Instructor: Brian Stitt
Workshop Duration: 50 minutes
Target Audience: All ages (adaptable content)
Format: Interactive demonstration + group discussion
Maximum Participants: 30

WORKSHOP OVERVIEW

This fast-paced, engaging session introduces participants to the exciting world of artificial intelligence and robotics through live demonstrations with the DJI RoboMaster EP Core. Participants will see AI and robotics in action, explore real-world applications, and discuss both the opportunities and concerns surrounding these transformative technologies. The session balances hands-on demonstrations with collaborative thinking exercises to spark imagination about how AI and robotics can serve humanity.

Learning Objectives

By the end of this 50-minute session, participants will:

- Understand fundamental concepts of AI and robotics
- See practical demonstrations of autonomous systems, computer vision, and robotic manipulation
- Identify real-world applications that benefit people and society
- Articulate both opportunities and concerns about AI/robotics
- Think creatively about AI-robotics solutions to everyday challenges
- Recognize how these technologies can augment human capabilities

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SESSION TIMELINE

Opening: Welcome & Hook (5 minutes)
0:00 - 5:00

Activity: The Robot Awakens

- Engaging entrance: Instructor controls robot using a tablet, demonstrating various capabilities
- Robot moves forward, backward, side-to-side showcasing omnidirectional movement

- Demonstrate precise gripper arm movements - opening, closing, reaching, lifting
- Show fluid transitions between different movement modes
- Set the stage: "What you just saw is the future—and it's here today"

Quick Introductions:

- Instructor background
- What is a robot? What is AI?
- The DJI RoboMaster EP Core: Education meets innovation

Segment 1: Seeing AI in Action (13 minutes)
5:00 - 18:00

Live Demonstration Sequence:

Demo 1: Autonomous Navigation (3 min)

- Robot can navigate using programming languages and tablet or mobile device
- Explain: Sensors, decision-making, real-time processing
- Real-world connection: Self-driving cars, warehouse robots

Demo 2: Computer Vision & Object Detection (3 min)

- Robot has a camera and can navigate using only the tablet
- Explain: Cameras as "eyes," pattern recognition, AI learning
- Real-world connection: Medical imaging, quality control, facial recognition

Demo 3: Robotic Manipulation (3 min)

- Robot also has an arm that can be controlled via tablet to pick up objects
- Explain: Precision control, gripper technology, coordination
- Real-world connection: Surgical robots, manufacturing, assistive devices

Demo 4: AI-Powered Code Generation (3 min)

- Demonstrate using Claude.AI to generate Python code for controlling the RoboMaster robot
- Show live example: Ask Claude.AI to write code for a specific robot behavior
- Copy and paste the AI-generated code directly into the robot's programming environment
- Execute the code and watch the robot perform the requested action

- Explain: How AI can accelerate learning and development by understanding documentation and generating working code
- Real-world connection: AI coding assistants, rapid prototyping, accessible programming for all skill levels

Quick Q&A (1 min)

- Address immediate questions about demonstrations

Segment 2: Interactive Brainstorming (12 minutes)
18:00 - 30:00

Activity: AI + Robotics Solution Building

Introduction (2 min):

- Distribute "AI & Robotics Solutions Worksheet" (see below)
- Explain the activity structure
- Form small groups (3-4 people) or work individually if preferred

Collaborative Thinking Exercise (7 min):

Participants work through worksheet sections:

1. **What I Know** (1 min)
   - List AI and robotics examples they've encountered
   - Share one with the group
2. **Solution Creation** (4 min)
   - Brainstorm AI-robotics combinations for real problems
   - Focus on helping people or supporting jobs
   - Think creatively—no idea too wild!
3. **Quick Share-Out** (2 min)
   - 2-3 groups share one favorite idea
   - Instructor connects ideas to current technologies

Transition Statement: "These ideas show incredible potential—but let's be honest about the concerns too."

Segment 3: Balanced Discussion - Concerns & Opportunities (12 minutes)
30:00 - 42:00

Structured Discussion: Two Sides of the Coin

Part A: Voicing Concerns (5 min)

Instructor Prompts:

- "What worries you about AI and robotics?"
- "What have you heard in the news that concerns you?"

Common Themes (capture on whiteboard/screen):

- Job displacement and unemployment
- Privacy and surveillance
- Loss of human skills
- Technology dependence
- Ethical decision-making by machines
- Bias in AI systems
- Safety and control ("Will robots harm us?")
- Widening inequality

Validation: "These are real, important concerns that experts are working on right now."

Part B: Opportunities & Human Augmentation (7 min)

Instructor Presentation:

Reframing the Narrative: "AI and robotics aren't replacements—they're tools that help us do MORE with LESS."

Practical Examples of Support Technology:

1. **Healthcare:**
   - Robots assist surgeons with precision beyond human capability
   - AI detects diseases earlier than human eyes alone
   - **Result:** Doctors save more lives, not lose jobs
2. **Manufacturing:**
   - Robots handle dangerous, repetitive tasks
   - Humans focus on quality, design, and problem-solving
   - **Result:** Safer workplaces, more interesting jobs
3. **Accessibility:**
   - Robotic exoskeletons help paralyzed individuals walk

- AI-powered devices give sight to the blind
- **Result:** Independence and dignity for all people

4. **Education:**
   - Robots like our RoboMaster teach STEM skills
   - AI personalizes learning for each student
   - **Result:** Better education for everyone, teachers supported
5. **Disaster Response:**
   - Robots enter dangerous areas humans can't
   - AI analyzes data to predict and prevent disasters
   - **Result:** Lives saved, first responders protected
6. **Agriculture:**
   - Autonomous robots plant and harvest crops
   - AI optimizes water and fertilizer use
   - **Result:** More food, less waste, sustainable farming

Key Message: "The goal isn't AI OR humans—it's AI AND humans working together. Technology should amplify human potential, not replace it."

Segment 4: Hands-On Interaction (5 minutes)
42:00 - 47:00

Activity: Try It Yourself!

Volunteer Demonstrations:

- 2-3 participants control the robot via mobile app
- Simple tasks: Navigate to location, pick up object
- Experience the human-robot collaboration firsthand

While Waiting:

- Others can view close-up of robot components
- Ask questions about specific features
- See sensors and AI modules up close

Reflection Question: "How did it feel to control the robot? Did you feel empowered or overwhelmed?"

Closing: Next Steps & Resources (3 minutes)

47:00 - 50:00

Wrap-Up Message:

"Today you've seen that AI and robotics are not science fiction—they're powerful tools we can shape to benefit everyone. The key is:

1. **Education:** Understanding these technologies
2. **Ethics:** Asking important questions about use
3. **Inclusion:** Ensuring everyone benefits
4. **Action:** Using technology to solve real problems

YOU are part of this conversation. Your ideas, concerns, and creativity will shape how AI and robotics develop."

Resources Provided:

- Worksheet to take home
- List of online resources and learning opportunities
- Instructor contact for follow-up questions
- Information about full-day workshops

Final Interactive Element:

- Quick poll: "Who feels more excited about AI/robotics now?" (show of hands)
- "Who has concerns but sees potential?" (show of hands)
- "Who wants to learn more?" (show of hands)

Closing Statement: "Thank you for exploring AI and robotics with me today. Remember: Technology is a tool, and tools are only as good as the people who use them. Let's build a future where AI and robotics serve all of humanity."

USING CLAUDE.AI TO PROGRAM THE ROBOMASTER EP CORE

The Power of AI-Assisted Robotics Programming

One of the most exciting developments in robotics education is the ability to use artificial intelligence tools like Claude.AI to dramatically accelerate the learning and programming process. Claude.AI can leverage the vast knowledge available on the Internet, including official DJI RoboMaster documentation, community forums, and programming best practices, to generate working Python code that controls the robot exactly as you specify.

How Claude.AI Understands the RoboMaster Robot

Knowledge Integration: Claude.AI has been trained on extensive programming documentation and can access current information about:

- Official DJI RoboMaster SDK documentation
- Python programming syntax and best practices
- Robotics control algorithms and sensor integration
- Common programming patterns for autonomous systems
- Troubleshooting techniques and error handling

What Makes This Powerful:

- **No Need to Memorize Syntax:** Claude.AI knows the exact function calls, parameters, and structure needed
- **Instant Expert Knowledge:** Access to robotics expertise without years of study
- **Custom Solutions:** Generate code tailored to your specific task or challenge
- **Learning Accelerator:** See working examples and understand how they function
- **Accessibility:** Makes advanced robotics programming accessible to beginners

Step-by-Step: Using Claude.AI to Program Your Robot

Step 1: Define What You Want the Robot to Do

Be specific about the behavior you want. Examples:

- "Make the robot move forward 2 meters, turn 90 degrees right, then stop"
- "Program the robot to use its infrared sensor to avoid obstacles and navigate around them"
- "Create code that makes the robot pick up a red object using its arm and gripper"
- "Write a program where the robot patrols in a square pattern and beeps at each corner"

Step 2: Ask Claude.AI to Generate the Code

Example Prompt to Claude.AI:

I have a DJI RoboMaster EP Core robot. Can you write Python code that does the following:
1. Connects to the robot
2. Moves the robot forward 1.5 meters
3. Rotates the robot 180 degrees
4. Returns to the starting position
5. Plays a sound when complete

Please include comments explaining each section and proper error handling.

Step 3: Claude.AI Generates Working Code

Claude.AI will respond with complete, functional Python code like this:

python

```python
# Import the RoboMaster SDK
from robomaster import robot

# Create a robot instance
ep_robot = robot.Robot()

# Initialize the connection
print("Connecting to RoboMaster EP Core...")
ep_robot.initialize(conn_type="ap")

# Get the chassis module for movement control
ep_chassis = ep_robot.chassis

try:
    # Move forward 1.5 meters (150 cm)
    print("Moving forward 1.5 meters...")
    ep_chassis.move(x=1.5, y=0, z=0, xy_speed=0.7).wait_for_completed()

    # Rotate 180 degrees
    print("Rotating 180 degrees...")
    ep_chassis.move(x=0, y=0, z=180, z_speed=45).wait_for_completed()

    # Return to starting position (move back 1.5 meters)
    print("Returning to start...")
    ep_chassis.move(x=1.5, y=0, z=0, xy_speed=0.7).wait_for_completed()

    # Rotate back to original orientation
    print("Rotating back to original position...")
    ep_chassis.move(x=0, y=0, z=180, z_speed=45).wait_for_completed()

    # Play completion sound
    print("Task complete! Playing sound...")
    ep_robot.play_sound(robot.sound.COMPLETE).wait_for_completed()

except Exception as e:
    print(f"An error occurred: {e}")

finally:
    # Always close the connection properly
    print("Closing connection...")
    ep_robot.close()
    print("Done!")
```

Step 4: Copy and Paste the Code

Simple Process:

1. Copy the entire code block from Claude.AI's response
2. Open your Python development environment (IDLE, VS Code, PyCharm, or RoboMaster app)
3. Paste the code into a new file
4. Save with a descriptive name like `square_patrol.py`

Step 5: Run the Code and Watch Your Robot Work

Execution:

1. Ensure your robot is powered on and connected
2. Make sure you have adequate space for the robot to move safely
3. Run the Python script
4. Watch as the robot executes exactly what you specified!

Advanced Applications: Complex Tasks Made Simple

Example 1: Sensor-Based Navigation

Your Request to Claude.AI: "Write code that makes the RoboMaster continuously move forward but stop if it detects an obstacle within 30cm using the infrared sensor, then turn right 90 degrees and continue."

Result: Claude.AI generates complete obstacle avoidance code with sensor integration, decision logic, and smooth movement control.

Example 2: Robotic Arm Manipulation

Your Request to Claude.AI: "Create a program that moves the robotic arm to pick up an object at ground level, lift it 20cm, move forward 50cm, and gently place it down."

Result: Claude.AI provides code with precise arm positioning, gripper control, coordinated chassis-arm movement, and timing.

Example 3: Computer Vision Application

Your Request to Claude.AI: "Write code that uses the robot's camera to detect a red object, drive toward it, and stop when within 20cm of the object."

Result: Claude.AI generates code integrating computer vision libraries, color detection algorithms, and movement control based on visual feedback.

Why This Revolutionary for Education

1. Democratizes Robotics Programming

- Students without extensive coding backgrounds can create sophisticated robot behaviors
- Reduces frustration and increases engagement
- Allows focus on robotics concepts rather than syntax memorization

2. Accelerates Learning

- See working examples immediately
- Learn by modifying and experimenting with AI-generated code
- Understand programming patterns through practical application

3. Encourages Experimentation

- Easy to try "what if" scenarios
- Quick iteration on ideas
- Safe environment to explore creative solutions

4. Teaches AI Collaboration

- Learn how to effectively communicate tasks to AI
- Understand the importance of clear specifications
- Develop skills in prompt engineering

5. Bridges Theory and Practice

- Translate ideas into working code instantly
- Test concepts in real-world hardware
- Build confidence through successful implementations

Best Practices for AI-Assisted Robot Programming

Be Specific in Your Requests:

- ✅ Good: "Move forward 2 meters at 0.5 m/s speed, then rotate 90 degrees clockwise"
- ❌ Vague: "Make the robot move and turn"

Ask for Explanations:

- Request that Claude.AI include comments explaining the code
- Ask follow-up questions about how specific parts work
- Learn the "why" behind the code, not just the "what"

Start Simple, Build Complexity:

- Begin with basic movements
- Add one feature at a time
- Combine simple programs into complex behaviors

Test Safely:

- Always ensure adequate space
- Start with slower speeds when testing new code
- Keep the emergency stop accessible

Iterate and Improve:

- Run the code and observe behavior
- Ask Claude.AI to modify specific aspects
- Refine until you achieve exactly what you envision

Real-World Demonstration Script for Workshop
Live Demo Narrative:

"Watch this. I'm going to ask Claude.AI to write a program that makes our robot do something specific. Let's say... I want the robot to move in a figure-8 pattern."

[Show screen with Claude.AI open]

Type into Claude.AI: "Write Python code for a DJI RoboMaster EP Core to move in a figure-8 pattern. Include connection setup and proper cleanup."

[Wait 10-15 seconds while Claude.AI generates code]

"Look at this—Claude.AI just generated 30 lines of working code with explanations. I'm going to copy this..."

[Copy code, paste into development environment]

"...paste it here, and run it. Watch what happens."

[Execute code, robot performs figure-8 pattern]

"That's the power of AI working with robotics. In less than a minute, we went from an idea to a working program. Now imagine what YOU could create when you understand both robotics AND how to leverage AI tools like Claude!"

Educational Value: Teaching Students About AI Collaboration
Key Learning Objectives:

1. **Prompt Engineering Skills**
    - Learn to communicate clearly with AI systems

- Understand how to break complex tasks into specific requests
- Develop critical thinking about task specification

2. **Code Literacy**
   - Read and understand AI-generated code
   - Identify components and their functions
   - Modify code to experiment with variations
3. **AI as a Tool, Not a Replacement**
   - Understand AI generates code, but humans provide creativity and judgment
   - Learn when to use AI assistance vs. writing from scratch
   - Develop critical evaluation of AI-generated solutions
4. **Rapid Prototyping**
   - Test ideas quickly
   - Fail fast and iterate
   - Build confidence through successful implementations

Future of AI-Assisted Robotics Education

The integration of AI tools like Claude.AI with educational robotics platforms like the DJI RoboMaster EP Core represents a fundamental shift in how we teach and learn robotics:

Accessibility: Complex robotics is now accessible to students of all backgrounds **Speed:** Concept-to-implementation time reduced from hours to minutes **Creativity:** Students focus on "what" they want to create, not "how" to write every line **Engagement:** Immediate results maintain motivation and excitement **Scalability:** One instructor can support many students with varying skill levels

The Bottom Line: AI tools like Claude.AI don't replace learning—they amplify it. Students still need to understand robotics concepts, sensor integration, and control logic. But now they have a powerful assistant that helps them translate ideas into reality, troubleshoot problems, and explore possibilities faster than ever before.

This is the future of robotics education: humans and AI working together to push the boundaries of what's possible.

MATERIALS NEEDED

Instructor Equipment:

- 1× DJI RoboMaster EP Core (fully assembled, charged)
- Backup battery (charged)

- Mobile device with RoboMaster app
- Laptop with Internet access and Claude.AI open in browser (for live AI code generation demo)
- Python development environment (IDLE, VS Code, or RoboMaster Lab)
- Obstacle course materials (cones, blocks, colored objects)
- Whiteboard or flip chart for discussion notes
- Projection screen (optional, for showing robot camera feed and Claude.AI interface)

Participant Materials:

- "AI & Robotics Solutions Worksheet" (printed, 1 per person)
- Pens/pencils
- Resource handout with QR codes to learning materials

Room Setup:

- Open demonstration area (10'×10' minimum)
- Seating arranged to view demo space
- Tables for small group discussions
- Power outlet access

FACILITATION TIPS

For Mixed Age Groups:

- **Children (8-12):** Emphasize fun, excitement, possibilities
- **Teens (13-17):** Focus on careers, real-world impact, ethics
- **Adults:** Address job concerns directly, highlight augmentation
- **Seniors:** Show accessibility applications, reduce intimidation

Engagement Strategies:

- Use participants' names
- Validate all concerns and ideas
- Encourage questions throughout
- Make eye contact during discussions
- Keep energy high and pace brisk

Common Questions & Responses:

Q: "Will robots take my job?" A: "Some tasks will change, but history shows technology creates new jobs. The key is learning to work WITH robots, not compete against them."

Q: "Can AI think like humans?" A: "AI is great at specific tasks but doesn't truly 'think' or understand like we do. It processes patterns, not ideas."

Q: "What if AI makes mistakes?" A: "That's why humans remain in the loop for important decisions. AI is a tool to help us, not replace our judgment."

Q: "How do I learn more?" A: "Start with online courses, robotics clubs, or workshops like our 3-day intensive. The best way is hands-on practice!"

ACCESSIBILITY CONSIDERATIONS

For Participants with Disabilities:

- Ensure wheelchair access to demo area
- Provide audio description of robot actions if needed
- Offer alternative worksheets (large print, digital)
- Allow extra time for hands-on interaction

Language Support:

- Keep technical jargon minimal or explain terms
- Use visual demonstrations alongside verbal
- Provide translated materials if needed

ASSESSMENT GOALS

Knowledge Gained:

- ✓ Can identify at least 2 AI/robotics applications
- ✓ Understands difference between AI and robotics
- ✓ Recognizes both benefits and concerns

Attitude Shifts:

- ✓ Increased curiosity about technology
- ✓ More balanced view of AI (beyond fear or hype)
- ✓ Empowerment to participate in technology discussions

Action Items:

- ✓ Interest in further learning expressed
- ✓ Creative thinking about applications demonstrated
- ✓ Questions asked showing deeper engagement

FOLLOW-UP OPPORTUNITIES

For Interested Participants:

- 3-day intensive workshop registration
- Online community access
- Monthly "Robot Open House" sessions
- School/organization partnership opportunities

Post-Session Survey: Quick 5-question feedback via QR code:

1. How would you rate this session? (1-5 stars)
2. What was most interesting?
3. What concerns remain?
4. Would you recommend to others?
5. Interest in advanced workshops?

INSTRUCTOR NOTES

Pre-Session Checklist (15 min before):

- [ ] Robot fully charged and tested
- [ ] Obstacle course set up
- [ ] Demo programs loaded and tested
- [ ] Worksheets counted and ready
- [ ] Backup demo plan in case of tech issues
- [ ] Room temperature comfortable
- [ ] Emergency contact info posted

Backup Plan (If Robot Malfunctions):

- Have video of demonstrations ready
- Shift to extended discussion and worksheet time

- Show robot components and explain manually
- Focus on concepts rather than live demo

Time Management:

- Set phone timer for each segment
- Be prepared to condense Q&A if running long
- Hands-on interaction can be shortened if needed
- Prioritize discussion section—most valuable

VARIATIONS FOR DIFFERENT CONTEXTS

School Assembly (100+ students):

- Reduce hands-on to 1 volunteer
- Extend demonstration time
- Use large projection screen
- Simplified discussion format

Corporate/Professional Setting:

- Emphasize workplace applications
- Focus heavily on augmentation vs. replacement
- Include ROI and efficiency discussions
- Professional development angles

Community Center/Library:

- All ages welcome approach
- Emphasize accessibility and everyday applications
- Longer hands-on interaction time
- Family-friendly language

Senior Center:

- Focus on assistive technology
- Address specific age-related concerns
- Slower pace, more explanation
- Highlight health and safety applications

SUCCESS METRICS

A successful 50-minute session includes:

1. **Engagement:** 80%+ participants actively participating
2. **Understanding:** Clear recognition of AI vs. robotics concepts
3. **Balance:** Both opportunities and concerns discussed
4. **Inspiration:** At least 50% express interest in learning more
5. **Interaction:** All participants speak at least once or write on worksheet
6. **Time:** Session completes within 50-55 minutes
7. **Positivity:** Participants leave curious, not fearful

SAMPLE SCRIPT EXCERPTS

Opening Hook:

"Imagine a world where machines do the dangerous, dirty, and dull work—freeing humans to be more creative, more caring, and more human. That's not science fiction. That's the promise of AI and robotics. But like any powerful tool, these technologies bring both incredible opportunities and serious questions. In the next 50 minutes, we're going to explore both sides together."

Transition to Discussion:

"You've seen what this little robot can do. Now imagine millions of robots like this—in hospitals, farms, factories, even in your home. Exciting? Absolutely. Concerning? Maybe. Let's talk honestly about both."

Closing Inspiration:

"A century ago, people feared that cars would destroy jobs for horse carriage drivers. And they were right—those specific jobs changed. But cars created millions of NEW jobs and gave humanity unprecedented freedom. AI and robotics are the cars of our century. Yes, change is coming. But together, we can steer that change toward a future that works for everyone."

Workshop Version: 1.0 - Compact Edition
Duration: 50 minutes
Last Updated: November 2025
Developed by: Brian Stitt, Robotics & AI Education Specialist

This compact session can be extended to 60-75 minutes by adding more hands-on time or deeper discussion. Core content remains effective at 50 minutes.