

DaVinci MindScribe: An Adaptive AI Concept Sketch Machine

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Majors: Artificial Intelligence, Robotics & Embedded Systems, Digital Maker & Fabrication

SIP 311



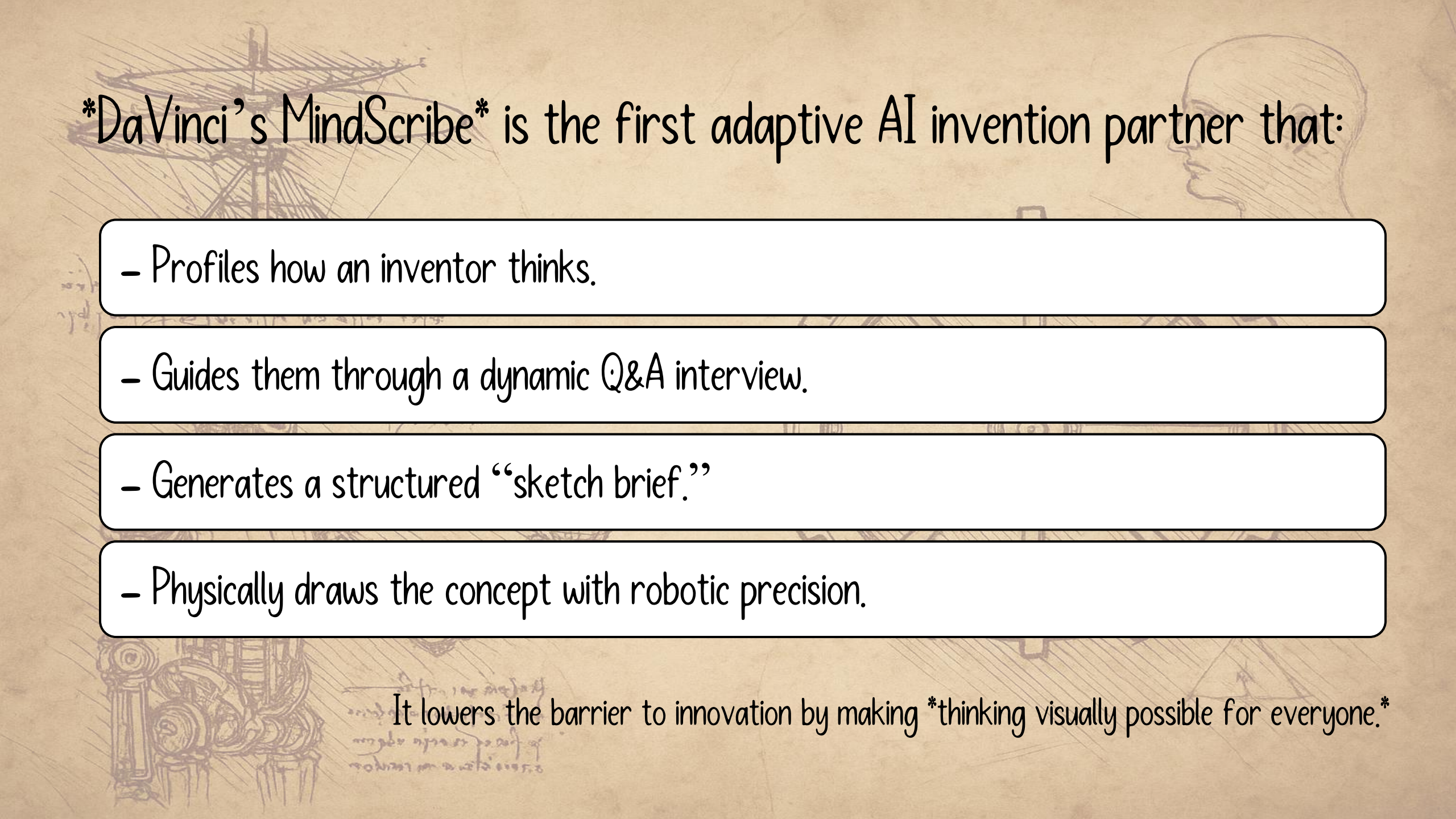
Every year, countless inventions die in people's heads because they can't be sketched.

- Traditional design tools assume artistic skill.

- AI generators require expert prompts and rarely capture technical intent.

- Patent offices and design firms need visuals, but the gap between *thought* and *paper* leaves non-artists locked out of innovation.

Without a universal bridge from mind to sketch, countless ideas remain invisible and unrealized.



DaVinci's MindScribe is the first adaptive AI invention partner that:

- Profiles how an inventor thinks.
- Guides them through a dynamic Q&A interview.
- Generates a structured “sketch brief.”
- Physically draws the concept with robotic precision.

It lowers the barrier to innovation by making *thinking visually possible for everyone.*

Domains: Artificial Intelligence, Robotics, Human—Computer Interaction, Digital Fabrication.

• Courses:

- CSC370 — Artificial Intelligence
- CSC373 — Machine Learning
- RBT205 — Fundamentals of Robotics
- RBT337 — Digital Vision Sensor Processing
- DBM200 — Prototyping & Fabrication
- PSY226 — Cognitive Psychology

• Skills & Tools:

- User profiling & adaptive dialogue (LLMs, prompt engineering).
- Generative AI for Da Vinci—style blueprint rendering.
- Vectorization & toolpath conversion (OpenCV, Potrace, Inkscape).
- Robotic motion control (Arduino/RPi, GRBL/ROS).
- Embedded systems & safety integration.

Today's MVP:

- User profiling questionnaire → creates cognitive fingerprint.
- Adaptive 20 Q interview → builds structured sketch brief.
- AI generation → Da Vinci-style sketch.
- Robotic plotting → physical drawing artifact.

Future Vision:

- Long-term adaptive learning per user.
- Sketch briefs exported across multiple AI systems.
- Ext. materials (paper, leather, wood, metal templates).
- Classroom + patent office integration.

Budget: \$300–500 (leveraging existing XY plotter + open-source AI).

SIP311: MVP loop (profiling
→ Q&A → robotic sketch).

SIP409: Expanded AI
training + materials
integration.

SIP411: Full branded
MindScribe platform.


Timeline

Target Market

- Makers & Inventors: democratizes prototyping.
- Educators: STEM/STEAM classrooms where students “think to sketch.”
- Patent Applicants: low-cost, rapid concept art for filings.
- Creative Professionals: jewelers, architects, product designers.
- Global Access: opens invention to regions lacking design resources.

MindScribe doesn't just help one person sketch it expands who gets to invent.


Prior Art



– Vizcom: Sketch + text → renderings. Requires artistic starting point.

– Adobe Firefly Prompt Builders: Guided text prompts. No invention-specific focus.

– AxiDraw / Plotter Bots: Translate vectors to pen motion. No AI guidance or profiling.

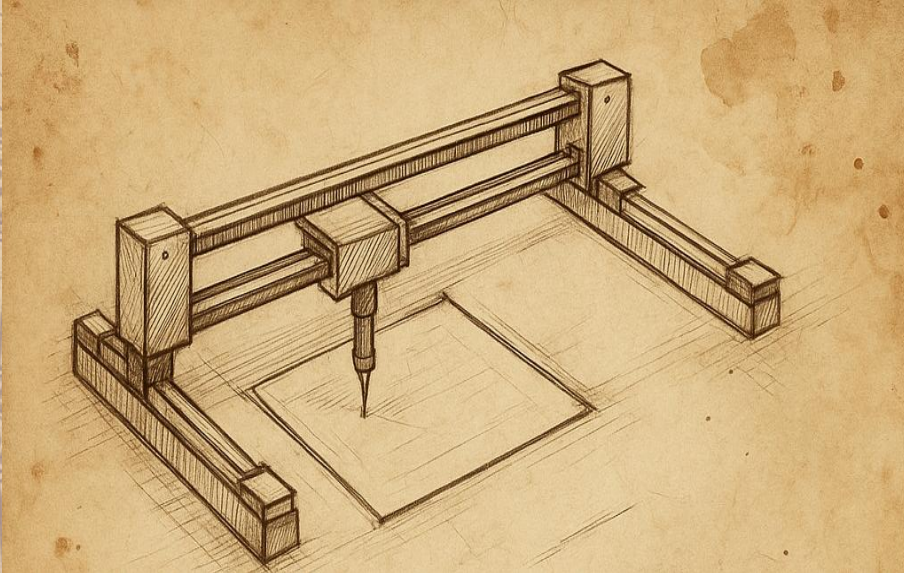


MindScribe is unique because it adapts to “*the inventor’s mind*”, not just their inputs. It systematizes discovery, generates a portable sketch brief, and delivers physical concept sketches.

- Vizcom. (2025). *Render Mode*. Vizcom. <https://docs.vizcom.ai/render-mode>
- Adobe. (2024). *Adobe Firefly: AI generative prompt builder*. Adobe. <https://www.adobe.com/products/firefly.html>
- Evil Mad Scientist Laboratories. (n.d.). *AxiDraw writing and drawing machines*. Retrieved September 15, 2025, from <https://axidraw.com>

Sample Profile Questionnaire

- Name (or alias): For personalizing the interaction.
- Favorite color: A hint at aesthetic preference.
- Favorite gadget or tool you've ever owned: Reveals design values (simplicity, complexity, durability, novelty).
- Do you usually picture ideas in words, shapes, or moving parts? This tells the system whether to steer the Q&A toward descriptive language, visual geometry, or mechanical function.
- When you imagine an invention, what excites you most: how it looks, how it works, or how people will use it? This sets priority (form, function, or impact).



Possible Questions from 20 Questions

- What is the core purpose of your idea? (e.g., what problem does it solve, or what action does it perform?)
- How is it powered or set in motion? (mechanical, electrical, biological, manual, etc.)
- What are the key parts or components you imagine it having? (list 3–5 nouns: gears, sensors, frame, etc.)

