

Network Engineers

AI profoundly augmenting network design, optimization, and incident response, shifting focus to strategic architecture and resilience.

EXPOSURE	WINDOW	ADOPTION TODAY	READING
55 Elevated exposure	3–7 yrs until change lands	High	The role is being reshaped. Exposure is the share of today’s work AI can plausibly take on within the window.

§ 01 WHAT IS HAPPENING

What is happening to network engineers

Impact

AI tools are autonomously monitoring network health, optimizing traffic flow, automating configurations, and enhancing cybersecurity. This compels Network Engineers to radically pivot towards high-level strategic planning, complex troubleshooting, ethical AI governance, and fostering irreplaceable human collaboration for highly resilient and efficient networks.

Risk

Radical role overhaul; pervasive automation leading to significant workflow redefinition and specialized human focus.

The Network Engineer role is undergoing a profound and accelerating redefinition by AI. AI will assume command of vast routine monitoring, performance tuning, and much of the administrative burden in network infrastructure. Network Engineers must immediately pivot to becoming experts in leveraging AI for hyper-efficiency and enhanced strategic insights, intensely validating AI outputs for accuracy and reliability, and dedicating their expertise to the irreplaceable human elements of the role: profound network architectural design, nuanced troubleshooting for ambiguous issues, and critical ethical decision-making regarding network security, scalability, and data privacy.

Sector readiness

Rapid & Transformative Integration

The networking and cloud infrastructure sectors are aggressively integrating AI, driven by overwhelming demand for efficiency, scalability, and resilience in modern network deployments. AI is rapidly moving beyond pilot stages to widespread adoption for network optimization, automated operations (AIOps for NetOps), and intelligent security, fundamentally altering traditional workflows and competitive dynamics.

§ 02 POSITION

Where you stand

- i The Network Engineer role is undergoing a profound and accelerating redefinition by AI, fundamentally restructuring network design, optimization, and incident response.
- ii AI will autonomously manage vast routine tasks, optimize traffic flow, and streamline security, compelling Engineers to pivot to indispensable strategic architecture and profound ethical governance.
- iii Survival and impact will hinge on Network Engineers mastering AI tools, critically validating AI outputs for reliability and ethics, championing ethical AI, and providing irreplaceable human judgment at the heart of highly resilient, secure, and hyper-efficient network infrastructures.

§ 03 ACTIONS

15 POINTS

What this means for you

Concrete changes to how the work gets done, in the order you are likely to meet them.

- 01 **AI-Driven Autonomous Network Monitoring & Anomaly Detection (AIOps for NetOps).** Network Engineers will command AI-powered AIOps platforms that autonomously monitor entire network landscapes – from routing to wireless – to predict outages, detect subtle anomalies (e.g., rogue devices, unusual traffic patterns), and identify root causes in real-time. This radically frees engineers from alert fatigue, demanding verification of AI insights and strategic oversight.
- 02 **AI-Optimized Network Design & Configuration.** Network Engineers will leverage generative AI and optimization algorithms to autonomously design and configure network topologies, routing protocols, and security policies. This dramatically accelerates design iteration, leading to more efficient, secure, and scalable networks.

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- 03 **Predictive Analytics for Network Performance & Capacity.** AI models will autonomously analyze historical network traffic, device health, and application performance metrics to predict future bandwidth needs, potential congestion points, or hardware failures. This enables proactive, autonomous scaling and robust network design.
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- 04 **AI-Powered Automated Network Remediation.** When a network incident occurs, AI tools will autonomously analyze vast amounts of network logs, device configurations, and traffic data. The AI will rapidly pinpoint the root cause and even suggest or execute autonomous remediation steps (e.g., re-routing traffic, isolating faulty devices), dramatically reducing Mean Time To Resolution (MTTR).
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- 05 **Generative AI for Network Documentation & Automation Scripts.** AI will autonomously draft initial versions of network architecture diagrams, configuration scripts, troubleshooting guides, and compliance reports. Network Engineers will rigorously review and approve these AI outputs for security, efficiency, and adherence to best practices.
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- 06 **Focus on Strategic Network Architecture & Resilience.** As AI assumes command of routine operational tasks, the paramount value of Network Engineers will be their irreplaceable human ability to design complex, highly resilient, and fully automated network architectures (e.g., Software-Defined Networks, Zero Trust). This shifts focus to ensuring "self-healing" and "self-optimizing" networks.
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- 07 **AI-Driven Network Security & Threat Detection.** Network Engineers will deploy AI-powered security solutions (e.g., Network Detection and Response) that autonomously analyze network traffic for sophisticated threats, identify anomalous user behavior, and automate responses to security incidents. This strengthens the overall security posture.
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- 08 **Ethical AI in Network Management & Data Privacy.** Network Engineers will bear profound responsibility for auditing AI systems for algorithmic bias (e.g., in traffic prioritization, user behavior analysis), ensuring data privacy, and upholding ethical standards for network access and data flow.
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- 09 **Human-AI Teaming for Incident Management.** Network Engineers will operate in seamless human-AI teams during network incidents. AI will provide real-time diagnostic insights, generate possible solutions, and perform autonomous containment. The human engineer will lead complex troubleshooting, apply nuanced judgment, and make critical decisions for recovery.
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- 10 **AI for Cloud Networking & Hybrid Cloud Optimization.** Network Engineers are employing AI tools for dynamic optimization of network connectivity between on-premise data centers and multiple cloud providers. AI analyzes traffic patterns and costs to ensure efficient, secure, and highly available hybrid cloud networks.
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- 11 **Continuous Learning & Advanced Networking AI Literacy.** The exponential pace of AI integration in networking demands that Network Engineers commit to continuous, aggressive learning of new AI-powered tools, advanced networking technologies (e.g., SD-WAN, SASE), and their profound capabilities and ethical implications, as a foundational competency.
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- 12 **Specialization in AI-Driven Network Operations.** The field will see a significant rise in Network Engineers specializing in NetDevOps, focusing on designing, implementing, and managing robust, scalable CI/CD pipelines specifically for network configurations and policies, ensuring continuous network integration and delivery.
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- 13

AI-Powered Network Automation & Orchestration. Network Engineers will leverage AI to autonomously orchestrate complex network changes, deploy configurations, and manage network devices across vast, distributed infrastructures. This minimizes manual errors and accelerates network provisioning.
- 14

Leadership in Network Transformation. Network Engineers in leadership roles will play a crucial role in guiding their organizations through the pervasive adoption of AI in networking, advocating for strategic network solutions, and fundamentally reshaping the future of enterprise network infrastructure.
- 15

Strategic Alignment of Network with Business Goals. As AI streamlines operational tasks, Network Engineers will dedicate more time to high-level strategic network planning, designing resilient and scalable networks that directly align with and contribute to the organization's overarching business strategy, maximizing business value.

What is pushing this change

- 01

Explosive Growth of Network Traffic & Data. Modern networks generate petabytes of traffic data, logs, and performance metrics, overwhelming manual analysis and demanding AI.
- 02

Unprecedented Complexity of Network Architectures (SDN, Hybrid Cloud). Intricate, distributed network systems across on-premise, cloud, and edge environments make manual management untenable, forcing pervasive AI adoption.
- 03

Urgent Demand for Hyper-Resilient & Available Networks. Businesses and users demand 24/7, near-zero downtime for network services; AI predicts and prevents outages autonomously, enhancing reliability.
- 04

Relentless Pressure for Network Cost Optimization. Network infrastructure can be a significant cost center; AI optimizes traffic routing, resource utilization, and energy consumption.
- 05

Critical Shortage of Highly Skilled Network Engineers. The severe global shortage of experienced network engineers compels aggressive AI adoption to radically augment human capacity.
- 06

Pervasive Cyber Threats & Need for Automated Network Security. AI-powered attacks necessitate more sophisticated, AI-driven defenses and automated incident response at the network layer.
- 07

Growth of Edge Computing & IoT Devices. The proliferation of IoT devices and edge computing generates massive, distributed network traffic requiring AI for management.
- 08

Demand for Hyper-Speed Data Transfer. Businesses demand instantaneous data transfer and low latency; AI optimizes network paths and performance.
- 09

Focus on Network Automation & Self-Healing. The goal of modern networks is self-managing, self-healing systems; AI is central to achieving this level of automation and resilience.
- 10

User Expectations for Seamless Connectivity. Users expect ubiquitous, high-speed, and reliable network connectivity, driving investment in AI for optimization.

Impact by sector

The headline figure is an average. Where you work changes the picture.

Network Architects	AI for autonomous network topology design, routing optimization, and capacity planning. Focus on strategic network architecture and resilience.
Network Operations Center (NOC) Engineers	AI for autonomous network monitoring, anomaly detection, predictive outage analysis, and automated remediation. Focus on proactive network operations.
Network Security Engineers	AI for autonomous network traffic analysis, threat detection, and automated security policy enforcement. Focus on continuous network security.
Cloud Network Engineers	AI for autonomous cloud network design, inter-cloud connectivity optimization, and cloud network cost management. Focus on cloud network efficiency and security.
Wireless Network Engineers	AI for autonomous wireless network optimization, signal strength management, and interference detection. Focus on high-performance and reliable wireless connectivity.

Skills to build

The skills that keep the human part of this work valuable as the routine part is automated.

- 01 **Network Architecture & Design.** Deep expertise in designing scalable, resilient, and secure network architectures (e.g., SDN, SD-WAN, Zero Trust).
- 02 **AI/ML Literacy & Network Automation.** Profound understanding of AI capabilities in network optimization, automation, and security, and the ability to leverage AI services for network management.
- 03 **Network Security & Compliance.** Mastery of network security best practices, intrusion detection, and using AI for continuous threat monitoring and automated policy enforcement.
- 04 **Problem-Solving & Root Cause Analysis (Network).** The ability to rapidly diagnose and resolve complex network issues in highly distributed environments, leveraging AI for hyper-fast root cause analysis.
- 05 **Communication & Collaboration (Cross-functional).** Effectively communicating complex network concepts and AI-driven insights to IT teams, business stakeholders, and senior leadership.

- 06

Cloud Networking Expertise. Expertise in designing, deploying, and optimizing network connectivity within and across cloud platforms (AWS, Azure, GCP), including hybrid cloud.
- 07

Data Analysis & Network Metrics. Ability to interpret vast amounts of network traffic, logs, and performance metrics (AI-processed) to identify trends and inform strategic decisions.
- 08

Adaptability & Continuous Learning. Willingness to rapidly learn new AI technologies, adapt network methodologies, and continuously evolve network design and operations.

§ 07 INSTRUMENTS

12 ENTRIES

Tools in use

KINDS OF TOOL WORTH KNOWING

- 01

AI-Powered Network Monitoring & AIOps. Platforms that use AI/ML to autonomously monitor network health, detect anomalies, predict outages, and perform root cause analysis.
- 02

AI for Network Design & Configuration. Software that leverages AI for autonomous design of network topologies, routing protocols, and configuration generation based on requirements.
- 03

Predictive Analytics for Network Performance. AI models that autonomously analyze historical network data and traffic patterns to predict future bandwidth needs, congestion, or device failures.
- 04

AI for Network Security (NDR, XDR). Network Detection and Response (NDR) or Extended Detection and Response (XDR) platforms that use AI/ML to autonomously detect sophisticated network threats.
- 05

AI for Network Automation & Orchestration. AI-powered platforms that autonomously orchestrate complex network changes, deploy configurations, and manage network devices across distributed infra-structures.
- 06

Generative AI for Network Documentation. Large Language Models (LLMs) used to autonomously draft initial versions of network architecture diagrams, configuration scripts, troubleshooting guides, and compliance reports.

NAMED TOOLS ALREADY IN USE

- Cisco ThousandEyes (Network Intelligence) / NetBrain (Automation)**

VISIT

Leading network intelligence platforms that leverage AI for real-time network visibility, performance monitoring, and root cause analysis.
- Anuta Networks (AT-AI Platform) / Itential (Automation AI)**

VISIT

Network automation and orchestration platforms that integrate AI for intelligent network design and configuration management.
- Kentik (Network Observability) / Dynatrace (Network Monitoring)**

VISIT

Network observability and performance monitoring platforms that use AI for anomaly detection and predictive analytics.

Darktrace (Cyber AI Platform) / Vectra AI (NDR)

VISIT

AI-powered Network Detection and Response (NDR) platforms that autonomously detect threats and anomalous behavior in network traffic.

Apstra (Intent-Based Networking) / Itential (Automation AI)

VISIT

Software-Defined Networking (SDN) and network automation platforms that integrate AI for intent-based networking and autonomous orchestration.

ChatGPT / Google Gemini (for network documentation)

VISIT

Generative AI models that can autonomously draft complex network diagrams, configuration files, and troubleshooting guides.

In practice

Ways people in this role are already using AI, and what they get from it.

Automate Network Performance Monitoring

EXAMPLE 1

HOW

Network Engineers will deploy an AI-powered Network Performance Monitoring (NPM) system. The AI will autonomously analyze vast network traffic data, device metrics, and application performance in real-time, identifying bottlenecks, latency issues, and bandwidth utilization anomalies.

GAIN

Significantly reduces manual monitoring effort, provides real-time insights into network health, and allows engineers to focus on strategic optimization.

Optimize Network Traffic Flow

EXAMPLE 2

HOW

Network Engineers will utilize an AI algorithm integrated into Software-Defined Networking (SDN) controllers. The AI will autonomously analyze real-time network conditions and application requirements, then dynamically re-route traffic to optimize performance, minimize congestion, and ensure critical service delivery.

GAIN

Optimizes network performance, reduces latency, improves bandwidth utilization, and ensures high availability of critical applications.

Predict Network Outages

EXAMPLE 3

HOW

Network Engineers can leverage an AI model that autonomously analyzes historical network device logs, traffic patterns, and error rates. The AI will predict potential network outages or severe performance degradations hours or days in advance, triggering autonomous pre-emptive actions or alerting human teams for intervention.

GAIN

Minimizes costly network downtime, prevents service disruptions, and shifts network operations from reactive firefighting to proactive, predictive management.

Generate Network Configurations

EXAMPLE 4

HOW

Network Engineers can instruct a generative AI tool to draft new network device configurations (e.g., for routers, switches, firewalls) based on desired network topology, security policies, and connectivity requirements. The AI will autonomously generate the config code for review.

GAIN

Significantly reduces manual configuration time, ensures consistent and error-free network setups, and accelerates network provisioning.

Enhance Network Security

EXAMPLE 5

HOW

Network Engineers will implement an AI-powered Network Detection and Response (NDR) system. The AI will autonomously analyze all network traffic for highly sophisticated threats, identify anomalous behaviors (e.g., unusual data exfiltration, lateral movement), and automatically quarantine affected devices.

GAIN

Provides hyper-proactive defense against sophisticated network threats, drastically reduces false positives, and enables autonomous threat containment, fundamentally strengthening network security.

§ 09 CONTEXT

How this role compares

Three neighbouring roles chosen to show the direction of travel.

Network Technicians
(Routine monitoring, basic configuration)

MORE EXPOSED

AI IMPACT

Catastrophic (AI can autonomously monitor network health; AI can automate basic configuration changes and troubleshooting.)

WORK MOVES TO

Immediate need for radical re-skilling into AI oversight, troubleshooting complex network issues, or specializing in SD-WAN/Cloud Networking.

AI Network Architects /
SD-WAN/SASE AI Engineers

DIFFERENT SKILLS, GROWING

AI IMPACT

Foundational (They design and build the AI algorithms and systems that power advanced network automation and security.)

WORK MOVES TO

Deep expertise in AI/ML algorithms, network architecture, cybersecurity, and software engineering, with a focus on intelligent networking.

Cybersecurity Managers
(Overall security strategy) / Cloud Solutions Architects
(Cloud integration)

COMPLEMENTARY, LESS EXPOSED

AI IMPACT

Low-Moderate Augmentation (AI assists in threat analysis for security managers; AI helps with network design for cloud architects), but core security strategy, risk governance, and high-level architectural vision remain paramount.

WORK MOVES TO

Overall cybersecurity strategy, risk governance, and fostering a security-aware culture (Cybersecurity Managers); High-level cloud architecture and multi-cloud integration strategy (Cloud Solutions Architects).

Closing judgement

For Network Engineers, AI is not merely a tool but a radical force of transformation that will fundamentally redefine their role. It will autonomously handle the mundane, amplify network capabilities, and streamline operations, compelling Engineers to pivot to indispensable strategic architecture, profound ethical governance, and nuanced problem-solving. The future Network Engineer will be a visionary orchestrator of human-AI collaboration, providing irreplaceable judgment at the heart of highly resilient, secure, and hyper-efficient network infrastructures.

Evidence and revisions

What the exposure figure rests on, what changed when it was last revised, and the published work cited for this role.

SCORE

50 to 55

WINDOW

3-7 years (unchanged)

The 4 October 2026 review moved the score up by 5 points.

Microsoft's AI applicability score for the matching occupation is 0.25, in the top quarter of 785 US occupations; Anthropic's observed exposure (the share of the occupation's tasks already being done with Claude) is 0.20, which is substantial by the standards of the 756 occupations measured; the US Bureau of Labor Statistics places it in the 'very high' AI-exposure tier; BLS projects employment to grow 7.7% over 2025–35. Blending our 2025 editorial figure (60%) with the 2026 evidence composite (40%) moves the score from 50 to 55.

MEASURES BEHIND THE SCORE

US Bureau of Labor Statistics · *Employment Projections 2025–35 and AI Exposure Categories* (27 August 2026)
AI-exposure tier: Very high. Projected employment change 2025–35: +7.7%. Matched to Computer network architects.

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Microsoft Research · *Working with AI: Measuring the Applicability of Generative AI to Occupations* (10 July 2025)
AI applicability score 0.25 (percentile 81 of 785 occupations) for SOC 15-1241.

PUBLISHER PDF ARCHIVED COPY

Anthropic · *Anthropic Economic Index report: Cadences* (26 June 2026)
Observed exposure 0.20 for SOC 15-1241 (percentile 84 of 756 occupations).

PUBLISHER PDF

UK Department for Science, Innovation and Technology · *Assessment of AI capabilities and the impact on the UK labour market* (28 January 2026)

UK context: around 70% of UK workers are in occupations with tasks AI could perform or enhance, above the US average; a one-standard-deviation rise in exposure was associated with a 3.9% fall in UK job postings.

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<https://www.careerguard.ai/sources>

§ 12 APPENDIX

Method and sources

Each report was written from a large body of published research and then, in October 2026, re-scored against occupation-level evidence: the US Bureau of Labor Statistics AI-exposure classification and 2025–35 projections, Microsoft Research's AI applicability scores and Anthropic's observed-exposure data, cross-checked against the reports listed in the Evidence section above. The organisations and publications below are the standing literature behind the narrative sections. Every source, with dates, licences and archived copies where we are permitted to hold them, is catalogued in the research library.

Scores are revised by blending the previous editorial figure (60%) with a composite of the three occupation-level measures (40%), capped at fifteen points per revision and rounded to the nearest five. The window shifts one notch when a score moves ten points or more. Hand adjustments are recorded with their reason in the revision log.

I GLOBAL AND MACROECONOMIC IMPACT OF AI ON WORK

World Economic Forum

The Future of Jobs Report series — Employer survey of expected job growth and decline, skill shifts and technology adoption (2020, 2023 and 2025 editions); *Artificial Intelligence and the Future of Entry-Level Work* (2026).

AI governance and transformation reports — Frameworks on ethical AI, talent strategy and industry transformation.

McKinsey Global Institute

AI, Automation and the Future of Work series — Research quantifying automation potential by task, sector and demographic, from "Jobs Lost, Jobs Gained" to "Agents, robots, and us" (2025).

Industry-specific reports — Financial services, healthcare, manufacturing and others.

PwC

Global AI Jobs Barometer — Annual analysis of job postings and productivity by AI exposure (2024–2026 editions).

Upskilling Hopes and Fears survey — Employee perceptions and readiness.

Microsoft Research and Anthropic

Working with AI (2025); *Anthropic Economic Index* (2025–2026) — Occupation-level usage data from Copilot and Claude conversations, the two observed-usage measures behind the 2026 revision.

Stanford Digital Economy Lab and Stanford HAI

Canaries in the Coal Mine? (2025–2026); *AI Index Report* (annual) — Payroll evidence on early-career employment in exposed occupations; annual measurement of AI capability, investment and adoption.

Deloitte

Human Capital Trends series — Workforce, talent and HR technology trends.

Tech Trends series — Emerging technologies and their business implications.

Accenture

Technology Vision series — Forward-looking analysis of emerging technology, with emphasis on AI.
Fjord Trends — Design, innovation and human experience in a digital world.

Boston Consulting Group

AI/ML insights and industry solutions — "The AI Revolution in the Workplace" and related research.

EY

AI and workforce reports — Adoption, talent strategy and ethics.

IBM Institute for Business Value

AI and automation studies — Business models, workforce evolution and leadership.

OECD

AI Policy Observatory — International data and policy on AI, labour markets and skills.
Employment Outlook — Labour-market trends including technological impact (2023–2026 editions).

International Labour Organization

Generative AI and Jobs: A Refined Global Index of Occupational Exposure (2025) — Task-level exposure gradients for every ISCO occupation; successor to the 2023 global index.

International Monetary Fund

Staff Discussion Notes on AI and work (2024, 2026) — Complementarity framing: where AI augments and where it substitutes.

UK Department for Science, Innovation and Technology

Assessment of AI capabilities and the impact on the UK labour market (2026) — UK occupational exposure and job-posting evidence.

Brookings Institution

AI and automation research — Economic and social implications, displacement and skills.

Yale Budget Lab and Goldman Sachs Research

Tracking the Impact of AI on the Labor Market; AI and the US labour market (2026) — Aggregate labour-market monitoring; macro displacement estimates.

Oxford University (Oxford Martin School)

The Future of Employment — Frey & Osborne and subsequent research on susceptibility to automation.

MIT Technology Review

AI & Work — Reporting on AI research and its implications for industries and jobs.

Gartner

Hype Cycle for Artificial Intelligence — Maturity and adoption of AI technologies.
Future of Work reports — Workplace models and talent strategy.

U.S. Bureau of Labor Statistics

Employment Projections 2025–35; AI Exposure Categories; Occupational Outlook Handbook — Ten-year employment projections and, from the 2025 cycle, an AI-exposure tier for every detailed occupation.

Indeed Hiring Lab

AI at Work Report (2025) and posting-market updates — Skill-level transformation estimates and job-posting trends by occupation.

II CORE AI AND MACHINE-LEARNING RESEARCH

OpenAI

Research papers, blog and API documentation — Large language models, generative AI, safety and societal impact.

Google DeepMind

Research papers and blog — Reinforcement learning, AI for science, AGI and ethics.

Meta AI

Research papers and blog — Large language models, computer vision, AI for social good.

Hugging Face

Transformers library and model hub — Open-source state-of-the-art NLP models.

TensorFlow and PyTorch

Documentation and community forums — Core frameworks illustrating practical capability.

arXiv

cs.AI, cs.LG, cs.CV, cs.CL — Pre-print research.

NeurIPS and ICML

Conference proceedings — Top-tier academic research.

ACM and IEEE

Journals and proceedings — ACM Computing Surveys; IEEE Transactions on AI.

Kaggle

Datasets and competition solutions — Applied machine learning on real-world problems.

The Alan Turing Institute

Research and reports — Responsible and applied AI.

III ETHICAL AND RESPONSIBLE AI DEPLOYMENT

NIST

AI Risk Management Framework — Voluntary framework for managing AI risk.

European Commission

AI Act — Risk-tiered legal framework for AI.

Ethics Guidelines for Trustworthy AI — Principles for responsible development.

Partnership on AI

Research and best practice — Responsible AI development.

AI Now Institute

Annual reports — Social implications: power, inequality, rights.

ACM FAccT

Proceedings — Fairness, accountability and transparency.

Data & Society

Publications — Social implications of data-centric technology.

WIPO

Conversation on IP and AI — Intellectual-property implications of AI.

IEEE Global Initiative on Ethics of AI/IS

Ethically Aligned Design — Recommendations for ethical AI design.

Center for AI and Digital Policy

Policy briefs — Accountable AI policy.