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Springer
Studies in Computational Intelligence

AI in Software Engineering: Ensuring Quality, Reliability, and Security

From Requirements to Maintenance – Challenges and Solutions

Scopus Indexed | Edited Volume | Full chapter due · Sep 30, 2026 | Submission · ReviewPilot

Artificial intelligence — particularly generative AI and large language models — is no longer a peripheral tool in software engineering. From automated requirements analysis and AI-driven design to code generation, test creation, bug repair, and runtime adaptation, AI is now integral to the development process. Yet the **quality, reliability, and security** of AI-assisted software remain open challenges. This edited volume offers a comprehensive, **lifecycle-wide** examination — pairing every identified risk with concrete, evaluated solutions, industrial case studies, and comparative benchmarks of major AI coding models.

Themes & Topics of Interest

1 · Requirements & Design

Requirements extraction, ambiguity detection, AI-assisted architectural design risks.

2 · Code Quality & Security

Functional correctness, vulnerabilities, adversarial attacks, automatic repair.

3 · Testing & Verification

LLM test generation, metamorphic testing, formal verification, the oracle problem.

4 · Deployment & Maintenance

Auto-repair & CI/CD risks, runtime monitoring, technical debt.

5 · Ethics, Legal & Governance

Copyright, licensing, liability, emerging standards (ISO/IEC, IEEE).

6 · Industrial Case Studies

Real deployments, model benchmarks (Copilot, ChatGPT, StarCoder, CodeLlama).

Key Challenges Addressed

- Functional incorrectness & specification non-conformance
- Security vulnerabilities & adversarial attacks
- Performance and efficiency pitfalls
- Maintainability and technical debt
- Testing and validation gaps
- Legal, ethical, and licensing risks
- Operational and deployment risks

Important Dates

Aug 15, 2026	Abstract / proposal (300 words) — optional
Sep 30, 2026	**Full chapter submission deadline**
Oct 31, 2026	Notification of acceptance
Nov 30, 2026	Camera-ready (final) chapter
Q1 2027	Expected publication by Springer

How to Submit

Original, unpublished chapters in English (recommended max 30 pages, Springer format). Prepare with the official Springer book chapter template (LaTeX or Word). All submissions are managed through **ReviewPilot**.

Submit your chapter

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Indicative Book Outline

Six parts · nineteen chapters · from foundations to industrial case studies and future outlook

I. Foundations & Problem Space

- Introduction to AI in Software Engineering
- A Taxonomy of AI-Induced Failures Across the Lifecycle

II. Requirements, Design & Coding

- AI for Requirements Engineering: Opportunities & Pitfalls
- Functional Incorrectness in AI-Generated Code
- Security Vulnerabilities in AI-Assisted Code
- Performance & Efficiency of AI-Suggested Code

III. Testing, Verification & QA

- Automated Test Generation Using LLMs
- Formal Verification of AI-Produced Artifacts
- Validation Challenges & Solutions

IV. Deployment, Maintenance & Operations

- AI in Continuous Integration & Deployment
- Maintainability & Technical Debt
- Runtime Security & Operational Risks

V. Ethical, Legal & Governance Frameworks

- Copyright, Licensing & Provenance
- Liability & Accountability
- Building a Culture of Trustworthy AI in SE

VI. Industrial Case Studies & Future Outlook

- Industrial Experience Reports
- Benchmarking AI Models for Software Engineering
- Future Directions
- Conclusion

Primary Audience

Researchers
Software engineering, AI, cybersecurity, formal methods.

Practitioners
Developers, QA engineers, DevOps & security analysts.

Postgraduates
Courses on AI-assisted development & trustworthy AI.

Technical Leads
Decision frameworks for AI integration.

Policymakers
Understanding technical risks to inform regulation.

Educators
Ready-to-use resource for AI-in-SE courses.

Submission Guidelines

1. **Prepare your manuscript.** Original, unpublished chapter in English; recommended maximum 30 pages in Springer format; not under consideration elsewhere.
2. **Use the Springer template.** Format your chapter with the official Springer book chapter template (LaTeX or Word) available from Springer's author resources.
3. **Submit via ReviewPilot.** Create a free account and submit your abstract and full chapter to the event at **reviewpilot.org/events/96f245d6-1b72-4d5b-b3bd-f0365e1dceb3/submit/**.

Questions?

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