University of Essex | Online **Journal Entries**

Thiago Contardi			
Unit	**Journal Summary**	**Application to the workplace**	**Personal Skill Development**
	Summarise key content	**Relate to the workplace.**	**Relate to personal and professional development. Be specific. Give examples.**
1	**Introduction to Agent-Based Computing:** Trends leading to agent-based computing, autonomy, and examples of agents in real-world systems.	Helped me understand how autonomous modules can act independently within software ecosystems, which allows design verification agents to make download decisions without user input.	Strengthened my ability to reason about autonomy and goal-directed behaviour, which I later applied when specifying my own autonomous verification workflow.
2	**Introducing First Order Logic:** Symbols, quantifiers, and reasoning in predicate logic; link between logic and natural language.	Logical representation supports rule-based filtering (e.g., YARA rules and anomaly scoring) in my project.	Improved my analytical thinking: I used logical predicates to define scanning conditions ("if file type = PDF ^ has embedded JavaScript -> flag").
3	**Agent Architectures:** Symbolic, reactive, and state-based architectures; history of agent development.	Helped me decide between reactive scanning (fast detection) and deliberative reasoning (AI analysis) for my Chrome extension.	Enhanced my capacity to select architectural styles fit for purpose, skills directly transferable to my role in software engineering and system design.
4	**Hybrid Agent Architectures:** Combining reactive + deliberative behaviours; case study analysis.	Guided the hybrid design of my verification agent (rule-based + ML-based).	Showed me how to integrate deterministic code with adaptive models, a competency now applicable to both AI and cybersecurity domains
5	**Agent Communication:** Speech act theory; KQML; ontologies for shared meaning.	Influenced how agents in distributed systems could report scan results or alerts across services securely.	Improved my understanding of interoperability; I later applied these principles to design standardised JSON messages between a browser extension and server.
6	**Working Together:** Designing dialogues using KQML and KIF; collaboration among agents.	Reflected in multi-component communication in my project (browser agent - AI server - database).	Enhanced my teamwork skills in group project work, especially defining clear interfaces and responsibilities, mirroring inter-agent communication.
7	**Natural Language Processing (NLP):** Principles, approaches, and technologies behind NLP.	Inspired exploration of using lightweight language models (DistilBERT) for document classification in malware detection.	Expanded my knowledge of ML pipelines and text understanding;
8	**Understanding Natural Language Processing (NLP):** Word2Vec demonstration; parse trees; syntactic analysis.	Provided insight into text feature extraction for detecting phishing phrases in documents.	Developed practical Python skills (tokenisation and parsing)
9	**Introduction to Adaptive Algorithms:** Artificial Neural Networks (ANNs), Deep Learning, and adaptive behaviour.	Guided my selection of anomaly-detection algorithms for the verification agent's AI module.	Strengthened my technical literacy in ML; I now understand backpropagation and feature learning, which informs both current and future AI projects.
10	**Deep Learning in Action:** Practical applications of deep learning: ethical and social implications.	Connected to my project's ethical considerations, balancing data use, false positives, and user trust.	Reinforced my awareness of responsible AI; I incorporated transparent reporting to ensure accountability in autonomous decisions.
11	**Intelligent Agents in Action:** Application of agents in Industry 4.0; smart factories and agent-based modelling.	Showed parallels between industrial agents and my cybersecurity agent, both improve efficiency through autonomy and data coordination.	Broadened my perspective on cross-domain AI use
12	**The Future of Intelligent Agents:** Emerging directions and ethics of AI agents; evaluating future risks and benefits.	Encouraged consideration of how autonomous agents may evolve toward more general AI capabilities in workplace automation.	Strengthened my reflective practice: