Reference ID	Title	Authors	Year	Journal or Conference name	Vol.	No.	Research topic	Concrete security patterns	Concrete misuse/threat/attack patterns	Relationships among patterns	Characteristics	Vulnerability and threats addressed	Quality Measurement	Pattern modeling/description notation	Intended dev. Methodology	Evaluation	Phase/lifestage	Tooling/automation	Platform dependence
4	A collaborative process for developing secure component based applications	Bouaziz R., Kallel S., Coulette B.	2014	Proceedings of the Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises, WETICE			Pattern integration	Authentication, authorization, RBAC		N/A	[illegible]	N/A	N/A	SPEM for process, Java/AspectJ code	Model driven methodology	Example	Requirements/analysis, design, implementation	Prototype tool for automatic integration and code generation	EJB platform
5	A comparative study of software security pattern classifications	Alvi A.K., Zulkernine M.	2012	Proceedings - 2012 7th International Conference on Availability, Reliability and Security, ARES 2012			Classification, Catalog, Map	N/A	N/A	N/A	Confidentiality, integrity, availability, and accountability for classification	Threat modeling	Classification quality metrics	N/A	N/A	N/A	Any	N/A	N/A
6	A comprehensive pattern-driven security methodology for distributed systems	Uzunov A.V., Fernandez E.B., Falkner K.	2014	Proceedings of the Australian Software Engineering Conference, ASWEC			Development methodology	Authentication, Secure two-party communications,	Identity spoofing, Session state poisoning, Message secrecy violation	Yes	Unclear	Unclear	N/A	UML-like	N/A	Example	Requirements analysis,design	N/A	N/A
7	A comprehensive pattern-oriented approach to engineering security methodologies	pp. 112-137; Uzunov A.V. Falkner, Fernandez E.B.	2015	Inf Softw Technol			Development methodology	[illegible]	N/A	Yes	N/A	N/A	N/A	pattern language	methodology engineering	None	All	N/A	N/A
8	A decision support map for security patterns application	Bouaziz R., Kammoun S.	2015	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	9158		Classification, Catalog, Map	RBAC Session, System check Point, Authorization, Reference monitor	N/A	Yes	Confidentiality, availability	N/A	N/A	UML, aspect template	MDD, AOP (aspect-oriented programming)	Example	Analysis, Design, Implementation	N/A	N/A
9	A framework for exploiting security expertise in application development	Balopoulos T., Gymnopoulos L., Karyda M., Kokolakis S., Gritzalis S., Katsikas S.	2006	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	4083 LNCS		Knowledge base and repository	[illegible]	None	Yes	Confidentiality, Accountability	None	None	Ontology	None	None	All	Ontology query language	Not specified
10	A framework for security driven software evolution	Guan H., Wang X., Yang H.	2014	ICAC 2014 - Proceedings of the 20th International Conference on Automation and Computing: Future Automation, Computing and Manufacturing			Knowledge base and repository	Not specified (general pattern repository)	None	No	Not Specified	CVSS	None	OWL	MDD	None	Reengineering, Evolution	MDA, Protégé OWL API	Legacy systems
11	A method for web security context patterns development from user interface Guidelines based on structural and textual analysis	Singpant P., Prompoon N.	2015	Lecture Notes in Electrical Engineering	339		Pattern extraction	TLS indicator	phishing	y	[illegible]		No	UML class diagram	N/A	simple example	UI design	No	No
12	A methodology for integrating access control policies within database development	Abramov J., Anson O., Dahan M., Shoval P., Sturm A.	2012	Computers and Security	31	3	Development methodology	RBAC (as an example)	N/A	No	Unclear (confidentiality, integrity)		N/A	UML + OCL	MDD	simple case study	design and implementation	eclipse FW, Dresden OCL, ATL	N/A
13	A methodology for mining security tactics from security patterns	Ryoo J., Laplante P., Kazman R.	2010	Proceedings of the Annual Hawaii International Conference on System Sciences			Pattern extraction	Authenticator		Yes	Resisting, Detecting, Recovering	N/A	N/A	N/A	N/A	Example	architecture design	N/A	N/A
14	A methodology to develop secure systems using patterns	Fernandez E.B., Larrondo-Petrie M.M., Sorgente T., VanHilst M.	2006	Integrating Security and Software Engineering: Advances and Future Visions			Development methodology	analysis pattern,RBAC pattern,		Yes	Confidenticality	N/A	N/A	UML	Secure Software Lifecycle, Model Driven Development	N/A	Requirements, Analysis, Design and Implementation	N/A	general
15	A modeling and formal approach for the precise specification of security patterns	Hamid B., Percebois C.	2014	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	8364 LNCS		Specification	Secure Communication Patterns		Yes	Confidenticality	N/A	N/A	Original Protocol Specification	N/A	N/A	Design	Verification Tool	N/A
16	A multi-dimensional classification for users of security patterns	VanHilst M., Fernandez E.B., Braz F.	2009	Journal of Research and Practice in Information Technology	41	2	Classification, Catalog, Map	XACML Access Control Evaluator Pattern	N/A	No	N/A	N/A	N/A	[illegible]	N/A	N/A	[illegible]	N/A	N/A
17	A natural classification scheme for software security patterns	Alvi A.K., Zulkernine M.	2011	Proceedings - IEEE 9th International Conference on Dependable, Autonomic and Secure Computing, DASC 2011			Classification, Catalog, Map	[illegible]	N/A	Yes	CIA + accontability	Yes	N/A	Template, structured document	N/A	N/A	Requirements, design, implementation	N/A	N/A
18	A novel approach for the development and deployment of security patterns	Mourad A., Otrok H., Baajour L.	2010	Proceedings - SocialCom 2010: 2nd IEEE International Conference on Social Computing, PASSAT 2010: 2nd IEEE International Conference on Privacy, Security, Risk and Trust			Application	User Authentication Pattern, Service Access Control Pattern	n/a	no	availability	Yes	n/a	UML, natural langage	Aspect-oriented Programming	no	design, requirement	no	no
19	A pattern based approach for secure database design	Abramov J., Sturm A., Shoval P.	2011	Lecture Notes in Business Information Processing	83 LNBIP		Application	Authorization, RBAC	N/A	No	Confidentiality	Unauthorized access and use	N/A	UML with CCL	N/A	None	Design, Implements	[illegible]	N/A
20	A pattern-based general security framework : AAAAn ebusiness case study	Benameur A., Fenet S., Saidane A., Sinha S.K.	2009	2009 11th IEEE International Conference on High Performance Computing and Communications, HPCC 2009			Application	Web Presence, Business-to Customer, Operational Security	N/A	No	N/A	repudiation	N/A	N/A	SI*, Secure Tropos	None	All	N/A	SERENITY
21	A pattern-driven security advisor for service-oriented architectures	Schnjakin M., Menzel M., Meinel C.	2009	Proceedings of the ACM Conference on Computer and Communications Security			Application	SecurePipe, MessageConfidentiality		Yes	CIA + Authorisation	N/A	N/A	N/A	N/A	N/A	Analysis, Design	N/A	Web Services
22	A pattern-driven security process for SOA applications	Delessy N.A., Fernandez E.B.	2008	Proceedings of the ACM Symposium on Applied Computing			Application	[illegible]		Yes	Confidentiality, Integrity	N/A	N/A	UML-like	Model driven, MDA	Example	Analysis, Design, Implementation	N/A	[illegible]
23	A process model design and tool support for information assets access control using security patterns	Ratchakom M., Prompoon N.	2011	Proceedings of the 2011 8th International Joint Conference on Computer Science and Software Engineering, JCSSE 2011			Application	RBAC	N/A	Yes	Confidentiality	[illegible]	N/A	UML Activitiy diagram fo Process Model	N/A	N/A	Whole process of IAAC-system development	Yes, but unclear	N/A
24	A qualitative analysis of software security patterns	Halkidis S.T., Chatzigeorgiou A., Stephanides G.	2006	Computers and Security	25	5	Analysis	[illegible]		No	Availability	Unclear	N/A	UML	Unclear	Example	Analysis	N/A	N/A
25	A security engineering process for systems of systems using security patterns	Ruiz J.F., Rudolph C., Maña A., Arjona M.	2014	8th Annual IEEE International Systems Conference, SysCon 2014 - Proceedings			Development methodology	security solution for systems of systems		Yes	Unclear	N/A	N/A	SPT,UML	N/A	N/A	Modeling	tool for extracting security property or security solution	N/A
26	A security pattern-driven approach toward the automation of risk treatment in business processes	Varela-Vaca A.J., Warschofsky R., Gasca R.M., Pozo S., Meinel C.	2013	Advances in Intelligent Systems and Computing	189 AISC		Specification	NeutralizationSQLInjection, Neutralization of XSS, Input Validation (as examples)	N/A	No	Integrity, confidentiality (on the example)	Yes in ontology but a little	Yes (attribute and forces)	Proposed template	OPBUS framework	Example	Business process modeling	OPBUS framework exetnsion	Unclear
27	A Security Reference Architecture for cloud systems	Fernandez E.B., Monge R.	2014	ACM International Conference Proceeding Series			Application	[illegible]	[illegible]	Yes	Unclear	Misuse patterns and in metamodel	N/A	UML (class diagram, sequence diagram) and metamodel in UML	Unclear	Example	Requirements/analysis, design, (implementation), maintenance	N/A	Cloud
28	A semantic based certification and access control approach using security patterns on SEAGENT	Tekbacak F., Tuglular T., Dikenelli O.	2008	20th International Conference on Software Engineering and Knowledge Engineering, SEKE 2008			Application	Agent Authenticator, Agent Certification Authority, Access Controller	N/A	N/A	confidentiality, integrity, authentication, nonrepudiation	N/A	N/A	Protocol diagram for behaviour, unknown for structure	Secure Tropos, model driven design	Case study	Design	SEAGENT Plan Editor (a kind of model driven design tools)	Multi-agent systems (MAS)
29	A study of security architectural patterns	Rosado D.G., Gutiérrez C., Fernández-Medina E., Piattini M.	2006	Proceedings - First International Conference on Availability, Reliability and Security, ARES 2006	2006		Analysis	[illegible]	N/A	N/A	[illegible]	N/A	Security degree (L: Low M: Medium H: High)	UML class diagram	N/A	N/A	Any	N/A	N/A
30	A survey of security solutions for distributed publish/subscribe systems	Uzunov A.V.	2016	Computers and Security	61		Survey	[illegible]	[illegible]	N/A	Secrecy, Integrity, Availability, Accountability	[illegible]	N/A	N/A	N/A	N/A	Design	N/A	Distributed publish/subscribe systems
31	A taxonomy for assessing security in business process modelling	Ahmed N., Matulevicius R.	2013	Proceedings - International Conference on Research Challenges in Information Science			Classification, Catalog, Map	SRP1-5	N/A	N/A	Condentiality, integrity, availability	Some possible attacks are considered.	N/A	BPMN	N/A	Example	Business process modeling	N/A	N/A
32	A tool for managing evolving security requirements	Bergmann G., Massacci F., Paci F., Tun T.T., Varró D., Yu Y.	2012	Lecture Notes in Business Information Processing	107 LNBIP		Application	Trusted path	N/A	N/A	Integrity (unclear but may be CIA)	Abuse the situation	N/A	The declarative model query language of EMF-IncQuery	SeCMER, SI*, Problem Frames	Case study (Illustrative Example), experiment/workshop	Requirements engineering, evolution	[illegible]	N/A
33	A UML-based methodology for secure systems: The design stage	Fernandez E.B., Sorgente T., Larrondo-Petrie M.M.	2005	Proceedings of the 3rd International Workshop on Security in Information Systems, WOSIS 2005, in Conjunction with ICEIS 2005			Development methodology	N/A	N/A	N/A	N/A	Relate attacks to use cases.	N/A	N/A	MDA, model driven	N/A	Any	N/A	N/A
34	Abstract security patterns	Fernandez E.B., Washizaki H., Yoshioka N.	2008	PLoP08 - 15th Conference on Pattern Languages of Programs, Proceedings			Classification, Catalog, Map	[illegible]	N/A	Abstraction hierarchy, usage relationship	N/A	(Threat)	N/A	UML class diagram for relationship	N/A	N/A	Any	N/A	N/A
35	Abstract security patterns for requirements specification and analysis of secure systems	Fernandez E.B., Yoshioka N., Washizaki H., Yoder J.	2014	CIBSE 2014: Proceedings of the 17th Ibero-American Conference Software Engineering			Classification, Catalog, Map	[illegible]	N/A	Abstraction hierarchy, usage relationship	N/A	Threat (and regulation)	N/A	UML class diagram for pattern structure, UML class diagram for relationships	N/A	N/A	Requirements engineering, analysis	N/A	N/A
36	Achieving socio-technical confidentiality using security pattern in smart homes	Busnel P., El-Khoury P., Giroux S., Li K.	2008	Proceedings of the 2008 2nd International Conference on Future Generation Communication and Networking, FGCN 2008	2		Empirical and case study	XACML, its three variations	N/A	Combination of patterns	Confidentiality (and integrity, availability)	N/A	N/A	N/A	N/A	Case study (Illustrative Example), experiment/workshop	Design, deployment	N/A	Smart home
37	An analysis of the security patterns landscape	Heyman T., Yskout K., Scandariato R., Joosen W.	2007	Proceedings - ICSE 2007 Workshops: Third International Workshop on Software Engineering for Secure Systems, SESS'07			Survey	Asset valuation, Roles, RBAC, Replicated system, Standby	N/A	N/A	confidentiality, identification and data integrity	N/A	Quality of pattern documentation	Document	N/A	N/A	N/A	N/A	N/A
38	An approach for security patterns application in component based models	Bouaziz R., Kallel S., Coulette B.	2014	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	8583 LNCS	PART 5	Application	RBAC	N/A	N/A	N/A	N/A	N/A	UML, ATL	Model driven, component-based (aspect-orientation)	Case study (Illustrative Example), experiment/workshop	Design, implementation	Papyrus suite tool, ATL	N/A
39	An approach to model-based development of secure and reliable systems	Fernandez E.B., Washizaki H., Yoshioka N., VanHilst M.	2011	Proceedings of the 2011 6th International Conference on Availability, Reliability and Security, ARES 2011			Development methodology	Authorization, RBAC	N/A	N/A	Confidentiality, integrity, availability, availability	Threats, misuses	The number of threats handled by a system over the total set T, of all the threats of the system	UML	MDA, model driven	N/A	Any	N/A	N/A
40	An architecture for secure ambient intelligence environments	Serrano D., Maña A., Soria-Rodríguez P., Piñuela A., Sotirious A.-D.	2009	Advances in Soft Computing	51		Development methodology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Model driven	N/A	Development-time, run-time	[illegible]	Ambient Intelligence Environments
41	An architecture-centric approach to detecting security patterns in software	Bunke M., Sohr K.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6542 LNCS		Detection	Single Access Point	N/A	N/A	N/A	N/A	N/A	Resource Flow Graph (RFG)	Any	Case studies (detecting patterns in open source applications)	Maintenance, evolution	a reverse engineering tool-suite Bauhaus	N/A
42	An aspect-oriented approach for software security hardening: From design to implementation	Mouheb D., Talhi C., Mourad A., Lima V., Debbabi M., Wang L., Pourzandi M.	2009	Proceedings of 8th International Conference on New Trends in Software Methodologies, Tools and Techniques, SoMeT_09			Application	Secure Connection	N/A	N/A	N/A	N/A	N/A	UML, OCL	Model driven, aspect-orientation	Case study, experiment	Design, implementation	Security Hardening UML Profile (SHP), Aspect C++	N/A
43	An aspect-oriented approach for the systematic security hardening of code	Mourad A., Laverdière M.-A., Debbabi M.	2008	Computers and Security	27	42433	Application	Secure Connection, Add Access Control, Add Encryption	N/A	N/A	[illegible]	(Vulnerability and attack)	N/A	AspectC++ (and Hardening Plan Template)	Any	Case study, experiment	Implementation	AspectC++	N/A
44	An aspect-oriented approach to relating security requirements and access control	Alebrahim A., Tun T.T., Yu Y., Heisel M., Nuseibeh B.	2012	CEUR Workshop Proceedings	855		Application	RBAC	N/A	No ~~N/A~~	Confidentiality -> Unclear?	N/A	N/A	Problem Frame	Model driven, Problem Frame, Aspect-Oriented Requirements Engineering	Case study (Illustrative Example) ~~experiment/workshop~~	Requirements engineering	N/A	N/A
45	An attack scenario based approach for software security testing at design stage	He K., Feng Z., Li X.	2008	Proceedings - International Symposium on Computer Science and Computational Technology, ISCSCT 2008	1		Verification	[illegible]	[illegible]	Yes ~~Security patterns mitigate Attack patterns.~~	Confidentiality	STRIDE categories for threats, attack sequece	N/A	[illegible]	Any	Case study (Illustrative Example) ~~experiment/workshop~~	Design	N/A	N/A
46	An engineering process for security patterns application in component based models	Bouaziz R., Kallel S., Coulette B.	2013	Proceedings of the Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises, WETICE			Development methodology	RBAC	N/A	N/A	N/A	N/A	N/A	UML	SCRIP	Example	Design, implementation	ATL	N/A
47	An experience report of improving business process compliance using security risk-oriented patterns	Alaküla M.-L., Matulevičius R.	2015	Lecture Notes in Business Information Processing	235		Empirical and case study	Securing data fromunauthorized access etc.	N/A	N/A	N/A	N/A	N/A	UML	BPM	Case Study	?	N/A	BPM
48	An exploratory comparison of security patterns and tactics to harden systems	Noël R., Pedraza-García G., Astudillo H., Fernández E.B.	2014	CIBSE 2014: Proceedings of the 17th Ibero-American Conference Software Engineering			Analysis	[illegible]	[illegible]	N/A	N/A	N/A	N/A	N/A	architectural tactics	experiment & hypothesis analysis	N/A	N/A	N/A
49	An ontological interface for software developers to select security patterns	El Khoury P., Mokhtari A., Coquery E., Hacid M.-S.	2008	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Selection	Input validation and representation	N/A	N/A	N/A	SQL injection, XSS, buffer overflow	N/A	OWL	N/A	N/A	design	N/A	N/A
50	An ontology-based approach to security pattern selection	Guan H., Yang H., Wang J.	2016	International Journal of Automation and Computing	13	2	Selection	[illegible]	N/A	N/A	[illegible]	STRIDE	N/A	OWL	N/A	N/A	Architecture, design	security pattern search engine	N/A
51	An operational model and language support for securing XML documents	Hwang G.-H., Chang T.-K.	2004	Computers and Security	23	6	Application	N/A	N/A	N/A	Confidentiality	information disclosure	N/A	security description language	N/A	N/A	operation	N/A	XML
52	Analysis of application of security patterns to build secure systems	Ortiz R., Garzás J., Fernández-Medina E.	2011	Lecture Notes in Business Information Processing	83 LNBIP		Survey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
53	Analyzing and enforcing security mechanisms on requirements specifications	Li T., Horkoff J., Mylopoulos J.	2015	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	9013		Analysis	VPN	N/A	N/A	N/A								

54	Applicability of security patterns	[illegible]	2010	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6426 LNCS	PART 1	Analysis	secure pipes and filters etc.	N/A	N/A	N/A								
55	Applying information retrieval technique for security requirements verification based on security patterns	Changadwech C., Prompoon N.	2016	Lecture Notes in Engineering and Computer Science	1		Verification	reference monitor	N/A	N/A	N/A	N/A	N/A	UML use case description	N/A	Example	Design	N/A	N/A
56	Applying security patterns for component based applications using UML profile	Bouaziz R., Coulette B.	2012	[illegible]			Application	active replication	N/A	N/A	N/A	N/A	N/A	UML profile	N/A	Case study	Design	N/A	N/A
57	Architectural risk analysis of software systems based on security patterns	Halkidis S.T., Tsantalis N., Chatzigeorgiou A., Stephanides G.	2008	IEEE Transactions on Dependable and Secure Computing	5	3	Verification	多数	N/A	N/A	N/A	N/A	y(risk assessment)	N/A	N/A	risk assessment	Test?	N/A	N/A
58	ASE: A comprehensive pattern-driven security methodology for distributed systems	Uzunov A.V., Fernandez E.B., Falkner K.	2015	Computer Standards and Interfaces	41		Development methodology	[illegible]	N/A	N/A	N/A	多数 Is not mentioned clearly in paper.	N/A	UML	N/A	N/A example	analysis and design	N/A	distributed systems
59	Attack surface reduction for web services based on authorization patterns	Steinegger R., Schäfer J., Vogler M., Abeck S.	2014	SECURWARE 2014 - 8th International Conference on Emerging Security Information, Systems and Technologies			Application	RBAC, ABAC	None	No	Not Specified	None	Num. of Attack surfaces	UML	None	Case Study	Design	None	Web apps
60	Automated security service orchestration for the identity management in Web Service based systems	Warschofsky R., Menzel M., Meinel C.	2011	Proceedings - 2011 IEEE 9th International Conference on Web Services, ICWS 2011			Application	Identification and authentication	None	Comparing several identity management patterns	Not Specified	None	None	Form (UML use case + system design model)	SOA	Example	Design	None	SOA
61	Automated verification of security pattern compositions	Dong J., Peng T., Zhao Y.	2010	Information and Software Technology	52	3	Specification	[illegible]	None	No	Not Specified	None	None	CCS (a process algebra)	None	Case Studies	Design	a CWB-NC model checker	Not specified
62	Behavioral singletons to consistently handle global states of security patterns	Gunawan L.A., Kraemer F.A., Herrmann P.	2012	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	7272 LNCS		Application	singleton	inconsistency	No	Not Specified	None	None	UML	SPACE	Example	Design	Arctis (tool-set of SPACE)	Not specified
63	Best-practice patterns and tool support for configuring secure web services messaging	Tatsubori M., Imamura T., Nakamura Y.	2004	Proceedings - IEEE International Conference on Web Services			Application	[illegible]	None	weakly yes, because of the use of same impl. options	CIA	Eavesdropping, Falsification, Masquerade, Repudiation	None	XML	None	None	Requirements Analysis	itself	Web Services
64	Building a security reference architecture for cloud systems	Fernandez E.B., Monge R., Hashizume K.	2016	Requirements Engineering	21	2	Development methodology	[illegible]	Malicious virtual machine migration process	Yes, misuse to security	Not Specified	Elements in misuse and security patterns	None	UML	None	argumentation	Design	None	Cloud
65	Building high assurance secure applications using security patterns for capability-based platforms	Rimba P.	2013	Proceedings - International Conference on Software Engineering			Development methodology	Secure Logger	None	No	Not Specified	None	None	Not Specified	None	None	Design and Implementation	SAM modeling tool, SPIN	Not specified
66	Building secure systems: From threats to security patterns	Fernandez E.B., Mujica S.	2011	Proceedings - International Conference of the Chilean Computer Science Society, SCCC			Development methodology	Authorization, Reference Monitor, Log/Audit	None	yes	Not Specified	None	None	UML	None	None	[illegible]	None	Not specified
67	Challenges for a formal framework for patterns	Bayley I.	2014	Cyberpatterns: Unifying Design Patterns with Security and Attack Patterns			Analysis	structural patterns suh as passwords, privileges, and sessions	None	Yes	Not Specified	None	None	Formals such as Z notation	None	None	Design	None	Not specified
68	Characterizations and boundaries of security requirements patterns	Slavin R., Shen H., Niu J.	2012	2012 2nd IEEE International Workshop on Requirements Patterns, RePa 2012 - Proceedings			Specification	[illegible]	None	No	Not Specified	None	None	Form	None	None	Requirements	None	Not specified
69	Classifying security patterns	Fernandez E.B., Washizaki H., Yoshioka N., Kubo A., Fukazawa Y.	2008	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	4976 LNCS		Classification, Catalog, Map	[illegible]	None	Yes	Not Specified	None	None	UML	None	None	Design	None	Not specified
70	Composing Patterns to Construct Secure Systems	Rimba P., Zhu L., Bass L., Kuz I., Reeves S.	2015	Proceedings - 2015 11th European Dependable Computing Conference, EDCC 2015			Verification	[illegible]	None	No	Not Specified	None	None	Serscis Access Modeller (SAM)	None	Case study	Design, Test	Assurance case, Binary Decision Diagrams (BDD), Datalog	Not specified
71	Conformance checking of single access point pattern in JAAS using codecharts	Alzahrani A.A.H., Eden A.H., Yafi M.Z.	2015	2015 World Congress on Information Technology and Computer Applications, WCITCA 2015			Specification	Single Access point pattern (SAP)	None	No	Not Specified	None	None	Codecharts, LePUS3, first order logic, Z notation	None	Example	Design, Implementation	TTP Toolkit verifier	Java Authentication and Authorization Service (JAAS)
72	Connecting security requirements analysis and secure design using patterns and UMLsec	Schmidt H., Jürjens J.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6741 LNCS		Development methodology	SymmetricEncryptorDecryptor pattern		y	CI		No	UML	N/A	case study	analysis and architecture design	UMLsec	N/A
73	Context-aware Security@run.time deployment	Ouedraogo W.F., Biennier F., Da Silva C.F., Ghodous P.	2015	CLOSER 2015 - 5th International Conference on Cloud Computing and Services Science, Proceedings			Application	Dataencryption pattern, authentication		no				Formal + XML expression		case study			
74	C-SCRIP: Collaborative security pattern integration process	Bouaziz R., Krichen F., Coulette B.	2015	International Journal of Information Technology and Web Engineering	10	1	Development methodology	N/A	N/A	no	N/A	N/A	N/A	UML profiles	MDA-based	no	the whole process	code generation support	ex. CCM, EJB
75	Dealing with security requirements for socio-technical systems: A holistic approach	Li T., Horkoff J.	2014	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	8484 LNCS		Development methodology	[illegible]	No	no	CIA	No	no	goal modeling	Goal oriented	case study (smart grid)	analysis	original prototype tool	N/A
76	Defining re-usable composite aspect patterns: An FDAF based approach	Tian K., Cooper K.M.L., Feng K., Tang Y.	2008	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	5333		Development methodology	Account Lockout, log for audit, Account Lockout with Selective Event Logging	N/A	Yes (composition)	Confidentiality, integrity	Password guessing	OCL constraints	Aspect-oriented modeling, OCL, Formal Design Analysis Framework	Aspect-oriented development	Example	Analysis, design	Formal Design Analysis Framework tool	N/A
77	Defining security architectural patterns based on viewpoints	Rosado D.G., Gutiérrez C., Fernández-Medina E., Piattini M.	2007	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	4707 LNCS	PART 3	Specification	N/A	N/A	no	N/A	N/A	N/A	N/A	N/A	N/A	analysis and architecture design	N/A	N/A
78	Defining viewpoints for security architectural patterns	Rosado D.G., Gutiérrez C., Fernández-Medina E., Piattini M.	2006	SECRYPT 2006 - International Conference on Security and Cryptography, Proceedings			Specification	N/A	N/A	no	N/A	no	no	Architecture Pattern Template	no	no	Design	None	N/A
79	Designing secure SCADA systems using security patterns	Fernandez E.B., Larrondo-Petrie M.M.	2010	Proceedings of the Annual Hawaii International Conference on System Sciences			Development methodology	RBAC, authenticator, logger, authorization, firewall, IDS and VPN	[illegible]	no	all	None	no	UML	original	no	analysis and design	no	SCADA System
80	Developing a security patterns repository for secure applications design	[illegible]	2006	5th European Conference on Information Warfare and Security 2006, ECIW 2006			Knowledge base and repository	[illegible]		no	[illegible]	[illegible]	N/A	template, structured	N/A	not yet	design and implementation	no	N/A
81	Development of applications based on security patterns	[illegible]	2009	Proceedings - 2009 2nd International Conference on Dependability, DEPEND 2009			Development methodology	not mentioned	not mentioned	no	not mentioned	not mentioned	no	XML	Not mentioned	case study (prototype development)	implementation	API	ambient intelligence (context-aware applications)
82	Do security patterns really help designers?	Yskout K., Scandariato R., Joosen W.	2015	Proceedings - International Conference on Software Engineering	1		Empirical and case study	36 patten catalog (例:encrypted storage)	N/A	yes	depending on the patterns	CIAA (confidentiality, integrity, availability and accountability)	No. covered misuse cases	UML	N/A	yes	design	eclipse-based Papyrus UML editor	N/A
83	Does organizing security patterns focus architectural choices?	Yskout K., Scandariato R., Joosen W.	2012	Proceedings - International Conference on Software Engineering			Empirical and case study	[illegible]	[illegible]	yes (similar to the dependencies among security problem patterns)	CIA	N/A	no	UML	N/A	yes	architectural design and detailed design	UML editor (customized Eclipse environment)	N/A
84	Early security patterns: A collection of constraints to describe regulatory security requirements	Gandhi R.A., Rahmani M.	2012	2012 2nd IEEE International Workshop on Requirements Patterns, RePa 2012 - Proceedings			Specification	N/A	N/A	no	validation using visualization	N/A	N/A	formal modelimg	N/A	not yet	design	Alloy	N/A
85	Effective security impact analysis with patterns for software enhancement	Okubo T., Kaiya H., Yoshioka N.	2011	Proceedings of the 2011 6th International Conference on Availability, Reliability and Security, ARES 2011			Verification	anti CSRF pattern		yes	any		no	misuse case, threat tree, mal activity diagram	N/A	case study(iTrust)	requirement analysis and design	no	N/A
86	Elements of application security in the cloud computing environment	Mathew G.	2012	2012 IEEE Conference on Open Systems, ICOS 2012			Application	front-gate pattern, unified functional analyzer, encrypted channel	improperly configured redirector	no	Confidentiality	N/A	N/A	N/A	N/A	N/A	Design	N/A	N/A
87	Eliciting security requirements through misuse activities	Braz F.A., Fernandez E.B., VanHilst M.	2008	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Verification	as examples, RBAC, event logging	illegal money transferring	Yes	confidentiality,integrity, availability, and accountability	Some example threats are shown.	N/A	UML	methodology	N/A	Requirements, Analysis		N/A
88	Embedding security patterns into a domain model	Solinas M., Fernandez E.B., Antonelli L.	2009	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Development methodology	Authorization pattern	N/A	no	confidentiality,integrity, availability, and accountability	N/A	N/A	UML	N/A	N/A	Requirements, Analysis	N/A	N/A
89	Enforcing a security pattern in stakeholder goal models	Yu Y., Kaiya H., Washizaki H., Xiong Y., Hu Z., Yoshioka N.	2008	Proceedings of the ACM Conference on Computer and Communications Security			Application	RBAC (as an example)	N/A(only attack scinario)	no	Confidentiality	N/A? social level vulnerability based on na attack scinario	N/A	i*	i* base method	N/A	requirement	i* + manual	N/A
90	Enforcing security in smart homes using security patterns	Khoury P.E., Busnel P., Giroux S., Li K.	2009	International Journal of Smart Home	3	2	Empirical and case study	Authrization	N/A	no	Confidentiality	N/A	N/A	UML	N/A	N/A(implementation)	Design and Implementation	N/A	XACML(Web service)
91	Engineering Security into Distributed Systems: A Survey of Methodologies	Uzunov A.V., Fernandez E.B., Falkner K.	2012	Journal of Universal Computer Science	18	20	Survey	N/A	N/A	no	Confidentiality, integrity and availability	Yes	N/A	N/A	N/A	N/A	development	N/A	N/A
92	Enhancing model driven security through pattern refinement techniques	Katt B., Gander M., Breu R., Felderer M.	2013	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	7542 LNCS		Development methodology	non-repudiation	N/A	no	Confidentiality, inon-repudation	N/A	N/A	UML	MDD	N/A	Design	yes	Web services
93	Enterprise assets security requirements construction from ESRMG grammar based on security patterns	Supaporn K., Prompoon N., Rojkangsadan T.	2007	Proceedings - Asia-Pacific Software Engineering Conference, APSEC			Application	Security pattern全般	N/A	no	Condentiality, integrity, availability	N/A	N/A	N/A	N/A	y (case study)	requirement	N/A	N/A
94	Enterprise security pattern: A model-driven architecture instance	Moral-García S., Moral-Rubio S., Fernández E.B., Fernández-Medina E.	2014	Computer Standards and Interfaces	36	4	Application	secure SaaS	N/A	yes	Confidentiality	Yes	N/A	digagram	MDD	N/A	development	N/A	Cloud
95	Enterprise security pattern: A new type of security pattern	[illegible]		Security and Communication Networks	7	11	Development methodology	SECURE EXTERNAL ACCESS TO A PRODUCTION ENVIRONMENT	N/A	no	Confidentiality, integrity and availability	no	N/A	digagram	MDD	N/A	development	N/A	EA
96	Evaluating the implications of attack and security patterns with premortems	Faily S., Parkin S., Lyle J.	2014	Cyberpatterns: Unifying Design Patterns with Security and Attack Patterns			Analysis	Context Policy Management	Test Footprinting attack pattern	yes	Confidentiality, Accountability	yes	N/A	diagra, KAOS	CAIRIS	Example (webinos)	Design	CAIRIS tool	N/A
97	Evaluation of the Pattern-based method for Secure Development (PbSD): A controlled experiment	Abramov J., Sturm A., Shoval P.	2012	Information and Software Technology	54	9	Development methodology	RBAC	N/A	no	Confidentiality		N/A	UML+OCL	original method, Application-basedDomain Modeling (ADOM) framework	y (case study, controlled experiment)	Design	Security Modeling Tool (SMT)	DBMS
98	Evaluation of web application security risks and secure design patterns	Dalai A.K., Jena S.K.	2011	ACM International Conference Proceeding Series			Classification, Catalog, Map	[illegible]	N/A	no	Confidentiality, Integrity, availability	yes	N/A	N/A	N/A	N/A	design, analysis	N/A	N/A
99	Evolution of the MTA architecture: The impact of security	Hafiz M., Johnson R.E.	2008	Software - Practice and Experience	38	15	Empirical and case study	[illegible]	N/A	no	Confidentiality,availability	N/A	N/A	N/A	no	N/A	design	N/A	N/A
100	Exploring information security issues in public sector inter-organizational collaboration	Van Veenstra A.F., Ramilli M.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6846 LNCS		Empirical and case study	E-RBAC,Single Access Point/Check Point.	N/A	no	Confidentiality	N/A	N/A	UML	N/A	N/A	design, analysis	N/A	N/A
101	Extended software architecture based on security patterns	Savić D., Simić D., Vlajić S.	2010	Informatica	21	2	Application	Single Access Point pattern, RBACK, Check Point security	N/A	no	Confidentiality	N/A	N/A	UML	N/A	y (case study)	design	N/A	Java
102	Extensible security patterns	Robinson P.	2007	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Specification	N/A	N/A	no	N/A	threat modeling with anti-statements	N/A	formal modeling	N/A	no	In the future, code generation and automated verificaiton	no	no
103	Facilitating the use of TPM technologies using the serenity framework	Muñoz A., Maña A.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6906 LNCS		Development methodology	N/A	N/A	no	N/A	no	N/A	Original modeling notation like sequence diagram	development using TPM	no	development and at run time	no	TPM
104	Finding security bugs in web applications using a catalog of access control patterns	Near J.P., Jackson D.	2016	Proceedings - International Conference on Software Engineering	14-22-May-2016		Verification	[illegible]	as pattern violations	no	N/A	as pattern violations	N/A	formal modeling for alloy	N/A	Yes	static check	SPACE(Security Pattern Checker)	Ruby
105	Framwork for information security standards storage and retrieval using security patterns	Ruamjinda P., Prompoon N.	2013	Proceedings of the IEEE International Conference on Software Engineering and Service Sciences, ICSESS			Selection	[illegible]	N/A	Yes	N/A	no	N/A	structured	N/A	Yes	?	Yes	?
106	From security patterns to implementation using Petri nets	Horvath V., Dörges T.	2008	Proceedings - International Conference on Software Engineering SESS2008			Specification	Information Secrecy, Secure Communication	N/A	no	N/A => eavesdrop	no	N/A	petri nets	model driven dev.	no	design--implimentation	Yes	multi-agent system
107	Growing a pattern language (for security)	Hafiz M., Adamczyk P., Johnson R.	2012	SPLASH 2012: Onward! 2012 - Proceedings of the ACM International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software			Classification, Catalog, Map	[illegible]	no	Yes	N/A	N/A	N/A	Hierarchical Scheme	N/A	no	N/A	no	N/A
108	Identification and implementation of authentication and authorization patterns in the spring security framework	Dikanski A., Steinegger R., Abeck S.	2012	SECURWARE 2012 - 6th International Conference on Emerging Security Information, Systems and Technologies			Application	[illegible]	no	no	N/A	no	no	UML, XML	spring security	no	design, implimentation	Yes	spring framework

109	Identifying and implementing security patterns for a dependable security case – From security patterns to D-case	Patu V., Yamamoto S.	2013	Proceedings - 13th IEEE International Conference on Computational Science and Engineering, CSE 2013			Detection	no	no	yes		yes	no	D-Case diagram	no	no	requirement, design, implementation	no	no
110	Implementation support of security design patterns using test templates		2016	Information (Switzerland)	7	2	Verification		no	no	N/A	no	no	UML, OCL		Yes		Yes	no
111	Improving security design patterns with aspect-oriented strategies	Edge C., Mitropoulos F.	2012	Proceedings of the Annual Southeast Conference			Application		no	no	N/A	no	N/A (for quality of security)	UML	aspect oriented	Yes (modularity)	design, implementation	no	no
112	Improving the classification of security patterns		2009	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Classification, Catalog, Map		no	Yes	N/A	no	no	UML	no	Yes example	analysis, design	no	no
113	Integrating security patterns into the electronic invoicing process	Netter M., Pernul G.	2009	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Application		no	Yes		no	no		n/a	no	requirement	no	no
114	Integrating security patterns with security requirements analysis using contextual goal models	Li T., Horkoff J., Mylopoulos J.	2014	Lecture Notes in Business Information Processing	197		Application			no	integrity, confidentiality	no	no	Contextual Goal Modeling Language	n/a	no => example	requirement	Yes, the tool "MUSER" is used	no
115	Management patterns for network resilience: Design and verification of policy configurations		2014	Cyberpatterns: Unifying Design Patterns with Security and Attack Patterns			Specification	High-Volume Traffic Challenge	N/A	Yes (conflict among policies)	Availability	DDoS	N/A	Network policy specification (Ponder/Tab)	N/A	Example	Analysis, Architecture design	N/A	Network policy configuration
116	Measuring the level of security introduced by security patterns		2010	ARES 2010 – 5th International Conference on Availability, Reliability, and Security			Verification			yes	N/A	no		UML	no	no	design	no	no
117	Model checking security pattern compositions	Dong J., Peng T., Zhao Y.	2007	Proceedings - International Conference on Quality Software			Verification		no	no	n/a	no	no		modle checker	no	design	Yes	no
118	Model-driven security patterns application based on dependences among patterns		2010	ARES 2010 – 5th International Conference on Availability, Reliability, and Security			Application		no	no	confidentiality	no	no	UML	n/a	yes	design, implementation	ATL	no
119	Model-driven security with a system of aspect-oriented security design patterns	Nguyen P.H., Klein J., Le Traon Y.	2014	ACM International Conference Proceeding Series			Application	no	no	no	n/a	no	no	UML	n/a	no	design	no	no
120	Modeling and applying security patterns using contextual goal models	Li T., Mylopoulos J.	2014	CEUR Workshop Proceedings	1157		Application	Authenticator	no	no	n/a	no	no	UML	n/a	no	design, requirement	no	no
121	Modeling and performance analysis for security aspects	Dai L., Cooper K.	2006	Science of Computer Programming	61	1	Analysis		no	no		no	no		aspect-oriented	yes	design, analysis		no
122	Modeling design patterns with description logics: A case study		2011				Specification		no	no	non-repudiation	no	no		no	yes	design	Protege	no
123	Modeling misuse patterns		2009	Proceedings - International Conference on Availability, Reliability and Security, ARES 2009			Specification	no		Yes	availability	yes	no	Misuse Pattern Templates	no	no		no	no
124	Modeling secure systems using an agent-oriented approach and security patterns		2006	International Journal of Software Engineering and Knowledge Engineering		3	Application		no	yes	integrity, availability, privacy	no	no	Tropos		yes		no	no
125	Modelling security patterns using NFR analysis	Weiss M.	2006	Integrating Security and Software Engineering: Advances and Future Visions			Specification		no	yes		no			no	no	requirement, design	no	no
126	Moving from requirements to design confronting security issues: A case study		2009				Development methodology			no	confidentiality, integrity	yes	no	no	no	no	design	no	no
127	New Approach Targeting Security Patterns Development and Deployment	Mouret A., Otrok H., Bagjour L.	2011	Information Security Journal	20	42465	Application		no	no	no	no	no			experiment	design, development, deployment	AspectJ	no
128	On building secure SCADA systems using security patterns		2009	ACM International Conference Proceeding Series			Development methodology		no	no	no	yes	no		no	no	design	no	no
129	On the description of software security patterns	Bunke M.	2014	ACM International Conference Proceeding Series			Specification	no	no	no	no	no	no	natural language	no	no	N/A	no	no
130	Organizing security patterns		2007	IEEE Software	24	4	Empirical and case study			yes	confidentiality, integrity, availability				no	no	all	no	no
131	Pattern qualifications and examples of next-generation agile system-security strategies	Dove R.	2010	Proceedings - International Carnahan Conference on Security Technology			Classification, Catalog, Map		no	no	no	no	no		no	no	N/A	no	no
132	Pattern-based security requirements derivation from secure tropos models		2015	Lecture Notes in Business Information Processing	235		Analysis		no	no	confidentiality, integrity, availability	yes	no					no	no
133	Patterns and pattern diagrams for access control		2008		5185 LNCS		Specification		no	yes	no	no	no	pattern diagrams (original), UML	MDD (Model-Driven Development)	no	design	no	no
134	Patterns for security and privacy in cloud ecosystems		###				Development methodology		N/A	no => partially yes	confidentiality and integrity	no	N/A	UML	N/A	? No	Design	N/A	N/A => cloud-based ecosystem
135	Patterns transform architectures	Nafz M., Adamczyk P., Johnson R.	###				Application	securiy pattern	テーブルにて分類	no	confidentiality, availability, integrity	yes	N/A	N/A	N/A	no	development and at run time	N/A	N/A
136	Practical policy patterns	Thomsen D.	###				Analysis	access control	N/A	no	N/A	no	N/A	N/A	N/A	no	design	N/A	N/A
137	Preliminary evaluation of a software security learning environment	Hazeyama A., Saito M.	###	Studies in Computational Intelligence	578		Knowledge base and repository		N/A	Attack patterns	Yes	N/A	Vulnerability	N/A	N/A	N/A	no	Analysis, design	Knowledge base	N/A
138	Preventing and unifying threats in cyberphysical systems	Fernandez E.B.	###				Analysis	Thread model	threat	no	Not specified	None	N/A	N/A	N/A	no	N/A	N/A	N/A
139	Privacy patterns for online interactions		###				Analysis		N/A	no		N/A	N/A	N/A	N/A	no	N/A	N/A	N/A
140	Problem-oriented security patterns for requirements engineering	Alebrahim A., Heisel M.	###	ACM International Conference Proceeding Series			Application	N/A	problem pattern	no	Not specified	no	N/A	UML	n/a	no	Design	N/A	N/A
141	Quantitative evaluation of systems with security patterns using a fuzzy approach		###				Verification			attack pattern (STRIDE)	no		no	Fuzzy methodology	N/A	N/A	STRIDE ,examination	N/A	N/A
142	Scaling model driven security for inter-organizational workflows with WS-CDL and UML 2.0 bringing web services, security and UML together	Hafner M., Breu R.	###				Application	~~Web services~~ Unclear	no	no	~~accounting~~ Confidentiality, Integrity, Non-Repudiation		no	N/A	~~N/A~~ Model driven architecture	no	N/A	N/A	~~N/A~~, Web Service
143	Refining the pattern-based reference model for electronic invoices by incorporating threats	Netter M., Fernandez E.B., Pernul G.	###				Development methodology			misuse	no		no?	N/A	UML	N/A	no	Analysis	N/A	N/A
144	Reusable formal models for secure software architectures		###				Specification		no	no	accountability	no	N/A	formal modeling	N/A	feasibility, usability, correctness,	analysis(<+designer>)	N/A	N/A
145	Revisiting architectural tactics for security		###		9278		Classification, Catalog, Map	Context-Dependent Authorizer		no	Confidentiality, Integrity	no	N/A	N/A	N/A	N/A	design	N/A	N/A
146	SCRIStUDIO: A security pattern integration tool	Bouaziz R., Kammoun S.	###				Development methodology	N/A	N/A	no	N/A		no	UML	N/A	N/A	design, coding	N/A	N/A
147	SeCMER: A tool to gain control of security requirements evolution		2011		6984 LNCS		Verification	N/A	N/A	N/A	Not specified (Confidentiality?)	N/A	N/A	N/A	5th Problem Frames (PF) SeCMER	N/A	requirement analysis	Yes	N/A
148	Sectet: An extensible framework for the realization of secure inter-organizational workflows		2006	Internet Research	16	5	Development methodology		None	None	none	none	none	UML	MDA	Yes (case study)	Design, realization	none	Web Services
149	Secure component based applications through security patterns	Bouaziz R., Coulette B.	2012				Application	Authorization pattern, RBAC	N/A	N/A	Integrity, and confidentiality	N/A	N/A	UML	MDD + CBSE	case study	Design	N/A	N/A
150	Secure engineering and modelling of a metering devices system		2013				Empirical and case study	N/A	N/A	Yes	Confidentiality, Integrity, Availability	N/A	N/A	UML		case study	analysis, design	Yes	Not specified
151	Securing analysis patterns	Fernandez E.B., Yuan X.	2007	Proceedings of the Annual Southeast Conference	2007		Development methodology		No	No	Integrity	N/A	N/A	UML	Not specified	N/A	Domain analysis, Requirements, Analysis,	N/A	N/A
152	Securing distributed systems using patterns: A survey		2012	Computers and Security	31	5	Survey		N/A	No	CIA	N/A	Y?	Not specified	Not specified	No	Not specified	N/A	Not specified
153	Securing web applications with better 'Patches': An architectural approach for systematic input validation with security patterns	Sohn J.-W., Ryoo J.	2015				Development methodology	intercepting validator		N/A	avalability			text	N/A	Yes (case study)	design, implementation	N/A	PHP
154	Security and dependability in ambient intelligence scenarios: The communication prototype		2009		ISAS		Development methodology		N/A	N/A	Confidentiality, integrity, availability	denying services	N/A	UML	SERENITY approach	N/A	Analysis, design	SERENITY model	Ambient Intelligence (AmI) ecosystems
155	Security design patterns: Survey and evaluation		2007	Canadian Conference on Electrical and Computer Engineering			Survey		N/A	Yes	Integrity	N/A		UML	N/A	Yes	N/A	N/A	N/A
156	Security modeling for service-oriented systems using security pattern refinement approach		2014	Software and Systems Modeling	13	2	Development methodology		None	yes	confidentiality, integrity and availability	no	no	UML	Requirement analysis, design	yes(case study)	design	yes UML based tools for code generation	Web Services
157	Security pattern evaluation	Duncan I., Mujinck-Hughes J.D.	2014				Analysis	N/A	N/A	Yes	Confidentiality	N/A	N/A	Not specified		N/A	N/A	N/A	N/A
158	Security Pattern Lattice: A formal model to organize Security Patterns	Sarmah A., Hazarika S.M., Sinha S.K.	2008				Specification		N/A	Yes	integrity, confidentiality	N/A	N/A	Text, formula	~~Not specified~~ SPL	N/A	N/A	N/A	N/A
159	Security pattern mining: Systematic review and proposal		2011				Survey	N/A	N/A	N/A	Confidentiality, Integrity, availability	N/A	N/A	N/A	N/A	No	architecture design	N/A	N/A
160	Security patterns and a methodology to apply them	Fernandez E.B.	2009	Advances in Information Security	45		Development methodology		N/A	no	confidentiality, integrity, and availability	N/A	N/A	Not specified		No		none	no
161	Security patterns and requirements for internet-based applications		2006	Internet Research	16	5	Development methodology			denial-of-service	Yes	all	not specified	no	UML	Not specified	yes(case study)	design	none	no
162	Security patterns and secure systems design	Fernandez E.B.	2007		4748 LNCS		Development methodology	Packet Filter Firewall Pattern	N/A	Yes	N/A	N/A	N/A	text	Not specified	N/A	Design	none	N/A
163	Security patterns for capturing encryption-based access control to sensor data		2008				Application		N/A	Yes	Confidentiality	N/A	N/A		N/A	N/A	Analysis, design	N/A	Wireless sensors

164	Security patterns meet agent oriented software engineering: A complementary solution for developing secure information systems	Mouratidis H., Weiss M., Giorgini P.	2005	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	3716 LNCS		Specification	[illegible]	implementing of security issue into information system	Yes	avalability?	N/A	N/A	UML?	N/A	N/A	Implemention	N/A	N/A
165	Security patterns modeling and formalization for pattern-based development of secure software systems	Hamid B., Gürgens S., Fuchs A.	2016	Innovations in Systems and Software Engineering	12	2	Verification	N/A => Secure Communication Pattern (SCP)	N/A	N/A	N/A => data authenticity	N/A	N/A	Formula	N/A => MDE (Model Driven Engineering)	Discussion => example (ITS)	Algorithm => design	N/A	N/A
166	Security patterns: A method for constructing secure and efficient inter-company coordination systems	Yoshioka N., Honiden S., Finkelstein A.	2004	Proceedings - IEEE International Enterprise Distributed Object Computing Workshop, EDOC			Development methodology	N/A	N/A	Yes	avalability?	N/A	N/A	text	MDA	case study	development	N/A	N/A
167	Security patterns: Comparing modeling approaches	[illegible]	2010	Software Engineering for Secure Systems: Industrial and Research Perspectives			Specification												
168	Security requirements specification in service-oriented business process management	Menzel M., Thomas I., Meinel C.	2009	Proceedings - International Conference on Availability, Reliability and Security, ARES 2009			Application	SecurePipe, MessageConfidentiality, MessageIntegrity		N/A	Confidentiality, integrity	Malicious content based attacks, Protocol misuse	N/A	N/A	Model-driven process modeling	N/A	Process management	N/A	Service-oriented Business Process Management
169	Security solution frames and security patterns for authorization in distributed, collaborative systems	Uzunov A.V., Fernandez E.B., Falkner K.	2015	Computers and Security	55		Application	Authorization pattern	N/A	Yes	authorization	N/A	N/A	UML	MDA	case study	design	N/A	Distributed system
170	Selecting proper security patterns using text classification	Hasheminejad S.M.H., Jalili S.	2009	Proceedings - 2009 International Conference on Computational Intelligence and Software Engineering, CiSE 2009			Selection	N/A	N/A	Yes(classification)	N/A	N/A	N/A	N/A	N/A	Experiment	design	automatic method	N/A
171	SERENITY Aware System Development Process	Serrano D., Maña A., Llarena R., Crespo B.G.-N., Li K.	2009	Advances in Information Security	45		Development methodology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	model-driven	N/A	Design, implementation	SERENITY Run-time Framework used	N/A
172	SERENITY pattern-based software development life-cycle	Sanchez-Cid F., Maña A.	2008	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Development methodology	N/A	N/A	N/A	N/A	N/A	N/A	UML	model-driven	N/A	Whole development Life-Cycle	Serenity Methodology	N/A
173	Software engineering techniques applied to AmI: Security patterns	Sánchez-Cid F., Muñoz A., Serrano D., Gago M.C.	2006	Developing Ambient Intelligence - Proceedings of the First International Conference on Ambient Intelligence Developments, AmID 2006			Development methodology	N/A	N/A	N/A	N/A	N/A	N/A	N/A	model-driven	Case study	Implemention	SERENITY Run-time Framework used	N/A
174	Standardising business application security assessments with pattern-driven audit automations	Tryfonas T., Kearney B.	2008	Computer Standards and Interfaces	30	4	Application	[illegible]		Yes (Fig. 1)	Confidentiality, integrity, availability (especially integrity)	N/A	N/A	UML	N/A	N/A	Implemention	audit automation	N/A
175	Structural analysis of the check point pattern	Alzahrani A.A.H., Eden A.H., Yafi M.Z.	2014	Proceedings - IEEE 8th International Symposium on Service Oriented System Engineering, SOSE 2014			Analysis	Check Point security pattern		Yes	N/A	N/A	N/A	Codecharts	N/A	N/A	Analysis or Design	use Two-Tier Programming kit	N/A
176	Supporting security sensitive architecture design	Babar M.A., Wang X., Gorton I.	2005	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	3712 LNCS		Application	[illegible]		Yes	N/A	N/A	N/A	N/A	N/A	case study	architecture	N/A	N/A
177	Survey on body of knowledge regarding software security	Hazeyama A.	2012	Proceedings - 13th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing, SNPD 2012			Survey	none(包括)	none(包括)	Yes	N/A	XSS, SQLinjection	N/A	UML	！	N/A	none	N/A	N/A
178	Technical patterns for long term trusted archiving	Porekar J., Šaljič S., Klobučar T., Jerman- Blažič A.	2009	Proceedings of the 3rd International Conference on Digital Society, ICDS 2009			Classification, Catalog, Map	generic solution patterns	no	Yes	integrity and authenticity	N/A	N/A	N/A	N/A	case study	Analysis	N/A	N/A
179	TESEM: A tool for verifying security design pattern applications by model testing	[illegible]	2015	2015 IEEE 8th International Conference on Software Testing, Verification and Validation, ICST 2015 - Proceedings			Verification	Security Requirement patterns	一般的	No	N/A	N/A	N/A	OCL, UML	N/A	experiment(exercise)	Requirement or architecture	model testing tool	N/A
180	The credentials pattern	Morrison P., Fernandez E.B.	2006	PLoP 2006 - PLoP Pattern Languages of Programs 2006 Conference Proceedings			Application	credentials patterns		No	availabliity	tampering or disclosure	N/A	UML	N/A	Example	architecture	N/A	N/A
181	The history-based authentication pattern	[illegible]	2014	ACM International Conference Proceeding Series	09-13-July-2014		Application	Authentication patterns	None	Yes	Confidentiality, availability, authentication	N/A	N/A	UML	N/A	Example	Operation and maintenance	N/A	N/A
182	The ISDF framework: Integrating security patterns and best practices	Alkussayer A., Allen W.H.	2009	Communications in Computer and Information Science	36		Development methodology	[illegible]		Yes	Confidentialy, integrity	N/A	N/A	ISDF	N/A	Example	Requirement, architecture, implementation	N/A	N/A
183	The nature of order: From security patterns to a pattern language	Hafiz M., Adamczyk P.	2012	SPLASH'12 - Proceedings of the 2012 ACM Conference on Systems, Programming, and Applications: Software for Humanity			Classification, Catalog, Map	none(包括)		Yes	N/A	N/A	N/A	Pattern Language	N/A	N/A	Architecture, or operation and maintenance	N/A	N/A
184	The practical application of a process for eliciting and designing security in web service systems	Gutiérrez C., Rosado D.G., Fernández-Medina E.	2009	Information and Software Technology	51	12	Empirical and case study	none(包括)	none(包括)	Yes	Confidentiality, integrity	N/A	N/A	PWSSec(based on UML)	N/A	case study	architecture	support to PWSSec process	N/A
185	The security survey and anaylsis on supervisory control and data acquisition communication	Shahzad A., Musa S., Aborujilah A., Irfan M.	2014	Journal of Computer Science	10	10	Analysis	architecture pattern for SCADA communication		No	Confidentiality, integrity, availability, authentication, etc	SCADA/Protocols vulnerabilities	N/A	UML	SCADA security	N/A	Implemention	N/A	SCADA System
186	The Security Twin Peaks	Heyman T., Yskout K., Scandariato R., Schmidt H., Yu Y.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6542 LNCS		Development methodology	architectual security pattern for co-developers		Yes	N/A	N/A	N/A	N/A	security twin peaks	discussion	architecture	N/A	N/A
187	Thinking towards a pattern language for predicate based encryption crypto-systems	De Muijnck-Hughes J., Duncan I.	2012	Proceedings of the 2012 IEEE 6th International Conference on Software Security and Reliability Companion, SERE-C 2012			Application	[illegible]	N/A	Yes	Unclear	N/A	N/A	N/A	Unclear	Critique	Unclear	N/A	Unclear
188	Threat and countermeasure patterns for cloud computing	Okubo T., Wataguchi Y., Kanaya N.	2014	2014 IEEE 4th International Workshop on Requirements Patterns, RePa 2014 - Proceedings			Application	RBAC, etc.	Spoofing, etc.	Yes	Unclear	Unclear (Threat pattern)	N/A	UML	Unclear	Example	Unclear	N/A	Cloud
189	Threat assessment in the cloud environment - A quantitative approach for security pattern selection	Anand P., Ryoo J., Kim H., Kim E.	2016	ACM IMCOM 2016: Proceedings of the 10th International Conference on Ubiquitous Information Management and Communication			Selection	[illegible]	N/A	No	Confidentiality, Integrity and Availability	STRIDE	N/A	N/A	Unclear	Case study	Unclear	N/A	Cloud
190	Towards a better integration of patterns in secure component-based systems design	Bouaziz R., Hamid B., Desnos N.	2011	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6786 LNCS	PART 5	Application	[illegible]	N/A	No	Unclear (N/A)	N/A	N/A	UML profile	Component-based software engineering, MDA	Example	Unclear	N/A	Component-based software
191	Towards a classification framework for security patterns	Graziano A., Dearden A., Seaton J.W., Williams L.A.	2006	Proceedings of the 6th International Network Conference, INC 2006			Classification, Catalog, Map	N/A	N/A	Yes	Unclear	N/A	N/A	N/A	Unclear	N/A	Development and operation	N/A	Unclear
192	Towards a conceptual framework for security patterns	Blackwell C.	2014	Cyberpatterns: Unifying Design Patterns with Security and Attack Patterns			Classification, Catalog, Map	N/A (like survey on ways of organizing security patterns)	N/A	No	Confidentiality, integrity and availability	N/A	N/A	N/A	Unclear	N/A	Unclear	N/A	Unclear
193	Towards a generic process for security pattern integration	Fuchs A., Gürgens S., Rudolph C.	2009	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Pattern integration	SSL, TPM	N/A	Yes because of integration	Confidentiality and integrity	N/A	N/A	Formula	Unclear	Example	Unclear	N/A	Unclear
194	Towards a MOF/QVT-based domain architecture for model driven security	Hafner M., Alam M., Breu R.	2006	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	4199 LNCS		Application	RBAC	N/A	Yes as metamodel	Confidentiality and integrity	N/A	N/A	UML	MDA	Example	Unclear	EMF(MOF-QVT), ARCSTYLER	Unclear
195	Towards a pattern-based security methodology to build secure information systems	Ortiz R., Moral-Rubio S., Garzás J., Fernández-Medina E.	2011	Proceedings of the 8th International Workshop on Security in Information Systems, WOSIS 2011, in Conjunction with ICEIS 2011			Development methodology	N/A	N/A	No	Availability	Misuse pattern	N/A	N/A	SPEM	N/A	Entire	N/A	Unclear
196	Towards compliant reference architectures by finding analogies and overlaps in compliance regulations	Fernandez E.B., Yimam D.	2015	[illegible]			Development methodology	Authentication, authorization, encryption	N/A	No	Confidentiality and integrity	N/A	N/A	UML	Unclear	Example	Unclear Development	N/A	Unclear
197	Towards continuous information security audit	Kozlovs D., Cjaputa K., Kirikova M.	2016	CEUR Workshop Proceedings	1564		Analysis	[illegible]	N/A	No	Confidentiality, integrity and availability	Yes but a little	N/A	N/A	Business process modeling	Example	Requirements analysis	N/A	Unclear
198	Towards developing secure software using problem-oriented security patterns	Alebrahim A., Heisel M.	2014	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	8708		Development methodology	[illegible]	N/A	No	Authenticity, Confidentiality and integrity	N/A	N/A	Problem frame, UML	Twin peaks model	Example	Requirements	N/A	Unclear
199	Towards precise security patterns	Serrano D., Maña A., Sotirious A.-D.	2008	Proceedings - International Workshop on Database and Expert Systems Applications, DEXA			Development methodology	N/A	N/A	No	Confidentiality, integrity, availability, etc.	No	N/A	UML like	Unclear	Scenario	Requirements analysis, design, implementation	SERENITY Run-time Framework used	Unclear
200	Usability and security patterns	Ferreira A., Rusu C., Roncagliolo S.	2009	Proceedings of the 2nd International Conferences on Advances in Computer-Human Interactions, ACHI 2009			Development methodology	Explicit user audit N/A(not concrete)	None	Yes	Availability, popularity	None	Percentage of popularity and applicability	None	N/A	Experiment	Evaluation	N/A	N/A
201	Using patterns to understand and compare Web services security products and standards	Fernandez E.B., Delessy N.	2006	[illegible]	2006		Classification, Catalog, Map	[illegible]	N/A	Yes	Confidentiality, integrity	N/A	N/A	UML	UML modeling	Example	architecture design	N/A	Web Services
202	Using proven Reference Monitor patterns for security evaluation	Heckman M.R., Schell R.R.	2016	Information (Switzerland)	7	2	Verification	TCB subset security pattern	None	Yes	Mandatory Access Control	None	Completeness, Verfiability, Isolation	Trusted Network Interpretation		Trusted Computer System Evaluation Criteria			
203	Using security patterns for modelling security capabilities in grid systems	Aziz B., Blackwell C.	2014	Proceedings - IEEE 8th International Symposium on Service Oriented System Engineering, SOSE 2014			Application	Signature pattern, Inherited Certificate pattern	None	Yes	Trustworthiness	None	Signature and password authentication	Virtual Organization	Cloud	Evaluate the design space	Virtual Organization Lifecycle		Grid Operating System
204	Using security patterns to combine security metrics	Heyman T., Scandariato R., Huygens C., Joosen W.	2008	ARES 2008 - 3rd International Conference on Availability, Security, and Reliability, Proceedings			Verification	Authentication Enforcer, Secure Logger, Audit Interceptor	Deals with hostility of the environment	Yes	Integrity, Confidentiality, Availability	black box metrics not considered	security objectives of a system	from objectives -> patterns -> metrics	[illegible]	dependency tree		ATM example	
205	Using security patterns to develop secure systems	[illegible]	2010	Software Engineering for Secure Systems: Industrial and Research Perspectives			Development methodology	Misuse pattern	Misuse Activities	Yes	Access Control	Threats to a particular resource	Dimension Graph	UML	Metamodeling	Multidimensional Classification	Analysis, Design, Implementation	UML and OCL tools	SQL based systems
206	Using security patterns to tailor software process	Wagner R., Fontoura L.M., Fontoura A.B.	2011	SEKE 2011 - Proceedings of the 23rd International Conference on Software Engineering and Knowledge Engineering			Development methodology	[illegible]	ThreatAssessment, VulnerabilityAssessment	[illegible]	Security<Unclear or no>	Assess Threats, Assess Vulnerabilities	[illegible]	[illegible]	Rational Unified Process<もういっそprocesses tailoring>	Prioritization of Process Areas<case study>	Software Development Lifecycle	SMT-TOOL, PRIMA-TOOL, PMT-TOOL	SMT Framework
207	Using UML and security patterns to teach secure systems design	Fernandez E.B., Petrie M.M.L.	2005	ASEE Annual Conference and Exposition, Conference Proceedings			Knowledge base and repository	Role based access control pattern	None	Yes	confidentiality, integrity, attacks to availability, non-repudiation	None	None	UML	UML modeling<N/A>	None	OO design	UML	Java or C++<例示であって固定ではない>
208	Validating security design patterns application using model testing	[illegible]	2013	Proceedings - 2013 International Conference on Availability, Reliability and Security, ARES 2013			Verification	Security Requirement patterns, Security Design patterns	None	Yes	Security	None	None	UML and UCL	Test Driven Development	None	Testing	USE	None
209	Verifying implementation of security design patterns using a test template	[illegible]	2014	Proceedings - 9th International Conference on Availability, Reliability and Security, ARES 2014			Verification	Role based access control pattern	None	Yes	Security	None	None	UML	Test Driven Development	Test template	Testing	Model-based Testing tool	None
210	Vulnerability-based security pattern categorization in search of missing patterns	Anand P., Ryoo J., Kazman R.	2014	Proceedings - 9th International Conference on Availability, Reliability and Security, ARES 2014			Classification, Catalog, Map	[illegible]	N/A	No	Confidentiality, integrity and availability	OWASP vulnerability categorization	N/A	N/A	N/A	N/A	Unclear	N/A	None
211	Web security patterns for analysis and design	Okubo T., Tanaka H.	2008	PLoP08 - 15th Conference on Pattern Languages of Programs, Proceedings			Empirical and case study	Abuse pattern	Abuse, Leaks, Disclosure, Tampering	Yes	I & A, authorization, access control, logging	Unauthorized use, Unintended use, DoS	None	None	None	None	None	None	None
212	Wireless Information security system via role based access control pattern use case design	King A.C., Subramanian K., Kanhaa V.	2008	Proceedings of the 2008 International Conference on Computing, Communication and Networking, ICCCN 2008			Application	RBAC	N/A	N/A	Confidentiality	N/A	N/A	N/A	N/A	N/A	Analysis, Design	N/A	N/A
213	XML context's security patterns language: Description and syntax	Barhoom T.S.M., Shen-Sheng Z.	2007	Information Technology Journal	6	7	Application	Security of XML document pattern, XML for security function	None	Yes	Security	None	None	None	XML	XML Digital Signature	None	any XML tool	any platform
214	A classification methodology for security patterns to help fix software weaknesses	Regainia L., Salva S., Ecuhcurs C.	2017	Proceedings of IEEE/ACS International Conference on Computer Systems and Applications, AICCSA			Classification, Catalog, Map	[illegible]	N/A	Yes (depend, benefit, impair, alternative, conflict)	Confidentiality, Integrity, Availability, Navigability, Unambiguity, Usefulness	Vulnerability, weakness, CWE, CAPEC	Number of weaknesses	UML, Security Activity Graph (SAG)	N/A	Example	Requirements, Analysis, Design	Database	N/A
215	Exploiting traceability uncertainty between software architectural models and extra-functional results	Trubiani C., Ghabi A., Egyed A.	2017	Journal of Systems and Software	125		Analysis	Authorization, Role-based Access Control, Limited View, and Session Pattern	N/A	N/A	Confidentiality	N/A	security level based on traceability link	N/A	UML modeling	case study	architecture design	SoEfTraceAnalyzer	None
216	Guiding the Selection of Security Patterns for Real-Time Systems	Motii A., Hamid B., Lanusse A., Bruel J.-M.	2017	Proceedings of the IEEE International Conference on Engineering of Complex Computer Systems, ICECCS			Selection	SecureComm pattern, Firewall pattern	N/A	Yes	Data integrity, Confidentiality, Authenticity	Spoofing, Malicious alteration, Denial of service	N/A	UML, MARTE	[illegible]	Case Study (SCADA)	Requirements, Analysis, Design	Papyrus, SECOM Model Development Tools	N/A
217	Addressing Security Challenges in Cloud Computing - A Pattern-Based Approach	Anand P., Ryoo J., Kim H.	2017	Proceedings - 2015 1st International Conference on Software Security and Assurance, ICSSA 2015			Development methodology	[illegible]	N/A	Yes	Data integrity, Confidentiality, Authenticity	Data Breaches, Data Loss	N/A	N/A	Pattern Language	N/A	Requirements, Analysis, Design	N/A	N/A
218	A methodology of security pattern classification and of attack-defense tree generation	Regainia L., Salva S.	2017	ICISSP 2017 - Proceedings of the 3rd International Conference on Information Systems Security and Privacy	2017-January		Classification, Catalog, Map	Input Guard, Application Firewall	[illegible]	Yes	Web application attack (CAPEC)	Web application weakness (CWE)	N/A	diagram, tabular	Attack Defence Trees (ADTrees)	Web application attack (CAPEC-39)	Requirements, Analysis, Design	Talend(https://talend.com), ETL(Extraction, Load, Transform)	N/A

219	Systematic pattern approach for safety and security co-engineering in the automotive domain	[illegible]	2017	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	10488 LNCS		Development methodology	security gateway,	N/A	Yes	integrity	STRIDE	None	None	ISO 26262 and SAE J 3061 based on the V-model	Case study	[illegible]	MS Threat Modeling Tool 2016	Automotive domain
220	Idea-caution before exploitation: The use of cybersecurity domain knowledge to educate software engineers against software vulnerabilities	Nafees T., Coull N., Ferguson R.I., Sampson A.	2017	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	10379 LNCS		Knowledge base and repository	N/A	N/A	No	Unclear	OWASP Top 10 Vulnerabilities, VDB(CWE, CVE)	None	VAP template	None	Experiment	Software Development Lifecycle	N/A	N/A
221	Model-based design of reusable secure connectors	Shin M., Gomaa H., Pathirage D.	2017	CEUR Workshop Proceedings	2019		Application	[illegible]	N/A	Yes	Authentication, authorization, confidentiality, integrity, availability or non-repudiation	N/A	Performance comparison	UML	component-based software architecture development	Experiment	Design	N/A	N/A
222	Using data integration for security testing	Salva S., Regainia L.	2017	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	10533 LNCS		Verification	[illegible]	SQL injection, cross-site scripting via encoded URI schemes	Yes	N/A	DREAD, STRIDE	Efficiency and correctness of creating test cases	UML, Attack defence tree form	N/A	Experiment	Threat modelling and security test case execution	ADTool	data-store
223	Supporting secure business process design via security process patterns	Argyropoulos N., Mouratidis H., Fish A.	2017	Lecture Notes in Business Information Processing	287		Application	Authentication, authorisation, confidentiality, integrity, availability	N/A	No	Authentication, authorization, confidentiality, integrity, availability	User Impresonation (in example)	Questionnaire	BPMN	Process modelling	Experiment	Business process modeling	Secure Tropos	N/A
224	Security knowledge representation artifacts for creating secure IT systems	Ruiz J.F., Arjona M., Maña A., Rudolph C.	2017	Computers and Security	64		Knowledge base and repository	N/A but seems to be represented without its name in section 4.	N/A but seems to be represented without its name in section 4.	Yes	CI	N/A but seems to be able to represent any of them.	Assuracne, validation, verification	UML	N/A	example	Requirements, design	No	Generic and domain specific, an example is Web services
225	Anti-spyware security design patterns	Sheta M.A., El Salam El Hadad K.A., AboelseoudM H., Zaki M.	2016	Proceedings - 2016 6th International Conference on Instrumentation and Measurement, Computer, Communication and Control, IMCCC 2016			Application	Anti-spyware pattern	N/A	Yes	N/A	N/A	accuracy	feature list	N/A	Experiment	Runtime	WEKA	general
226	Framework for engineering complex security requirements patterns	Mazo R., Feltus C.	2016	2016 6th International Conference on IT Convergence and Security, ICITCS 2016			Development methodology	N/A	N/A	Yes	Confidentiality	N/A	N/A	UML	N/A	No	Requirements	No	Complex systems such as cloud
227	Threat Modeling in Cyber-Physical Systems	Fernandez E.B.	2016	[illegible]			Analysis	No	Theft of service misuse,	Yes, rel between threat and attack pattern	N/A	metamodel of both is provided	N/A	UML OCL	MDD	No	Design, Architecture	No	Cyber-phicical systems (CPS)
228	Secure design patterns for security in smart metering systems	Ur-Rehman O., Zivic N.	2016	Proceedings - EMS 2015: UKSim-AMSS 9th IEEE European Modelling Symposium on Computer Modelling and Simulation			Application	Secure Remote Readout, Key Manager, Backup Service, Transport Layer Security, Secure Logger	No	No	N/A	[illegible]	N/A	UML	N/A	No	Design	No	Smart Metering systems
229	A Metamodel for Security and Privacy Knowledge in Cloud Services	[illegible]	2016	Proceedings - 2016 IEEE World Congress on Services, SERVICES 2016			Development methodology		resource usage monitoring in cloud computing	Y	CIA	Cloud	N/A	modeling using metamodel	development using metamodel	only case study	ALL	N/A	Cloud
230	Building secure cloud architectures using patterns	Fernandez E.B.	2016	Proceedings - 2016 IEEE International Conference on Cloud Engineering Workshops, IC2EW 2016			Development methodology	Secure Virtual Machine Image Repository	Malicious virtual machine migration process	Y	STRIDE		N/A	Y	Building security reference architecture	qualitative validation	N/A	N/A	Cloud
231	An analytical study of security patterns	Ponde P., Shirwaikar S., Kreiner C.	2016	ACM International Conference Proceeding Series			Classification, Catalog, Map	N/A	N/A	N/A	CIA	[illegible]	N/A	N/A	N/A	N/A	all	N/A	N/A
232	Modeling and security in cloud ecosystems	Fernandez E.B., Yoshioka N., Washizaki H., Syed M.H.	2016	Future Internet	8	2	Development methodology	[illegible]	None	Yes	unclear	unclear		UML	None	explanation	design?	None	cloud
233	Modeling and analyzing security patterns using high level petri nets	He X., Fu Y.	2016	Proceedings of the International Conference on Software Engineering and Knowledge Engineering, SEKE	2016-January		Verification	[illegible]	None	Yes	Correctness	None	Reachiability	Petri net	None	simulation	Design?	PIPE+	Cyber physical systems
234	Towards the integration of security patterns in UML Component-based Applications	Motii A., Hamid B., Lanusse A., Bruel J.-M.	2016	CEUR Workshop Proceedings	1693		Development methodology	VPN	None	None	None	None	None	UML, OCL	model-based	Example	Architecture	None	None
235	Model-based real-time evaluation of security patterns: A SCADA system case study	Motii A., Lanusse A., Hamid B., Bruel J.-M.	2016	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	9923 LNCS		Analysis	SecureComm, SecureCommSSL, SecureCommIPSec, Firewall, PacketFilter, StatefulFiltering	N/A	Yes	Security, Realtime	N/A	Execution time	GoF Style	SCADA security	yes(case study)	Analysis, Design	Yes(UML tool)	SCADA System
236	Automatic enforcement of security properties	Horcas J.-M., Pinto M., Fuentes L.	2016	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	9830 LNCS		Application	Communication Encryption, Response Encryption, Strage Encryption	N/A	Yes	Confidencialilty	N/A	N/A	UML(component diagram and sequence diagram)	SPL(Variability Analysis), UML modeling	yes(case study)	Analysis, Design	Yes(M2M trans)	Unclear
237	Adaption of integrated secure guide for secure software development lifecycle	Lee K.-H., Park Y.B.	2016	International Journal of Security and its Applications	10	6	Development methodology	N/A	misuse case	N/A	N/A	misuse and threat	N/A	N/A	Secure Software development lifecycle	comparison	requreiment, design, implementation, testing	N/A	N/A
238	Software-security patterns: Degree of maturity	Bunke M.	2015	ACM International Conference Proceeding Series	08-12-July-2015		Analysis	[illegible]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	yes(program SLOC for pattern's implementation)	All	N/A	N/A
239	Guiding the selection of security patterns based on security requirements and pattern classification	Motii A., Hamid B., Lanusse A., Bruel J.-M.	2015	ACM International Conference Proceeding Series	08-12-July-2015		Selection	Autentication, Security Logger and auditor, Ahthorization, VPN	Threat and attack as risk-related concepts	N/A	Confidentiality, Integrity, Availability, Authenticity, Non-repudiation	Vulnerability and Threat	N/A	SEPM conceptual model	Pattern-based, model-based	Example	High level design	SEMCO(pattern-repository)	SCADA System
240	Improvement of security patterns strategy for information security audit applications	Atymtayeva L., Abdel-Aty M.	2015	BMSD 2015 - Proceedings of the 5th International Symposium on Business Modeling and Software Design			Knowledge base and repository	N/A	threat and attack as the element of security ontology	N/A	N/A		N/A	security ontology	N/A	N/A	development	security pattern repository	N/A
241	Building Secure Applications Using Pattern-Based Design Fragments	Rimba P., Zhu L., Xu X., Sun D.	2015	Proceedings of the IEEE Symposium on Reliable Distributed Systems	2016-January		Application	secure logger pattern,encrypted storage pattern	None	N/A	Confidentiality	attack analysis	N/A	N/A	Pattern-based, model-based	case study	analysis and design	Yes	N/A
242	A survey on security patterns	Yoshioka N., Washizaki H., Maruyama K.	2008	Progress in Informatics		5	Survey	Secure Logger	N/A	Yes	All	N/A	N/A	UML	N/A	N/A	All	N/A	N/A
243	Security patterns for automated continuous auditing	Kearney B., Tryfonas T.	2008	Information Security Journal	17	1	Application	many in table1	N/A	Yes	accountability	N/A	N/A	UML	N/A	Case Study (SAP R/3 ERP System)	N/A	NO	ERP