**Optional Course Textbook:**

*Biomedical Informatics: Computer Applications in Health Care and Biomedicine* (Health Informatics), Edward H. Shortliffe (Editor), 4th editeditio

### Background on Biomedical Informatics

### Shortliffe Chapters 1, 2, and 3

### Communications of the ACM, Volume 53 Issue 9, September 2010, [Computers in patient care: the promise and the challenge](http://portal.acm.org.ezproxy.lib.uconn.edu/citation.cfm?id=1810907&CFID=3678477&CFTOKEN=79549334) Stephen V. Cantrill, 42-47

### IEEE Computer, Volume 43, Issue 7, July 2010, see articles:

* + [Managing Healthcare through Social Networks](http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5445064), M.C. Domingo, 20-25.

### [Empowering Healthcare Patients with Smart Technology](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5510876), Piniewski, B.  Muskens, J.  Estevez, L.  Carroll, R.  Cnossen, R.,  27 - 34

### [Leveraging Pervasive Technologies to Improve Collection of Prostate Cancer Outcome Data](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5510877), Palta, J.R.  Frouhar, V.A.  Zlotecki, R.A.,  35 - 42

### [A Web 2.0 Model for Patient-Centered Health Informatics Applications](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5510878), Weitzel, M.  Smith, A.  de Deugd, S.  Yates, R.,  43 - 50

### Background on Patient and Medical Data and its Usage

* Caine K, Hanania R. [Patients want granular privacy control over health information in electronic medical records.](http://www.ncbi.nlm.nih.gov/pubmed/23184192) *J Am Med Inform Assoc* 2013;20(1):7-15.
* Sujansky WV, et al. [A method to implement fine-grained access control for personal health records through standard relational database queries.](http://www.ncbi.nlm.nih.gov/pubmed/20696276) *J Biomed Inform* 2010;43(5 Suppl):S46-50.
* Peleg, M, et al. [Situation-Based Access Control: privacy management via modeling of patient data access scenarios](http://www.ncbi.nlm.nih.gov/pubmed/18511349). *J Biomed Inform* 2008;41(6):1028-40.
* Kendall D, Quill E. A Lifetime Electronic Health Record for Every American. Washington, DC: Third Way, 2015. Available at: <http://www.thirdway.org/report/a-lifetime-electronic-health-record-for-every-american>
* Caine and Hanania (Caine & Hanania, 2013) studied the type and granularity of medical/health/fitness data for which patients wanted to control access. An earlier effort (Sujansky, et al., 2010) emphasized fine grained access control by role to allow a patient to define that, for example: a family member can view a subset of my medication list, a person’s personal physician may view/modify medical/health/fitness data, and an emergency physician can see all of an individual’s medical/health data in an emergent situation, etc. Previously, Peleg et al (Peleg, et al., 2008) described a method to establish privileges and access control from the perspective of the patient – called situation-based access control. More recently, it has been proposed (Kendall & Quill, 2017) that every American have a lifetime electronic health record that has complete information and is available from any location.

###  Background on Security/Access Control and Privacy

* Ferraiolo DF, et al. [Proposed NIST standard for role-based access control](http://xml.coverpages.org/NIST-RBAC-ACM2001.pdf), *ACM Transactions on Information and System Security (TISSEC)* 2001;4(3):224-274.
* Dittrich KR, Hartig M, and Pfefferle H. [Discretionary access control in structurally object-oriented database systems](https://www.semanticscholar.org/paper/Discretionary-Access-Control-in-Structurally-Dittrich-H%C3%A4rtig/e9c1d042103e1ffb77b852a6ba4ac244c6e8a4ed), Proc. of the 1988 Workshop on Database Security (DBSec), Kingston, Ontario, Canada.
* Fernández-Alemán JL, Señor IC, Lozoya PÁO, and Toval A. [Security and privacy in electronic health records: A systematic literature review](http://ac.els-cdn.com/S1532046412001864/1-s2.0-S1532046412001864-main.pdf?_tid=8cbe1542-3f87-11e5-8f54-00000aacb360&acdnat=1439228892_6054b772652bcb435a26839f9bfbea4a). *J Biomed. Inform* 2013;46(3):541–562.
* Alhaqbani B, Fidge C. [Access Control Requirements for Processing Electronic Health Records](http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.164.701&rep=rep1&type=pdf), *Business Process Management Workshops*, AHM ter Hofstede, B Benatallah, and H-Y Paik, (eds.), Springer, LNCS, 4928, 2008;371-382.
* Khan MFF,  Sakamura K. [Toward a synergy among discretionary, role-based and context-aware access control models in healthcare information technology](http://toc.proceedings.com/15749webtoc.pdf), *Proc. of 2012 World Congress on Internet Security (WorldCIS)*, June 2012;66-70.
* Hafner M, Memon M, and Alam M: [Modeling and Enforcing Advanced Access Control Policies in Healthcare Systems with Sectet.](http://link.springer.com/chapter/10.1007/978-3-540-69073-3_15?no-access=true) MoDELS Workshops 2007;132-144.
* Moehrke J.[Data Classification - a key vector enabling rich Security and Privacy Controls](http://healthcaresecprivacy.blogspot.com/2010/08/data-classification-key-vector-through.html), *Healthcare Exchange Standards Blog*, August 10, 2010. Available at: <https://healthcaresecprivacy.blogspot.com/2010/08/data-classification-key-vector-through.html>
* Health Information Portability and Accountability Act. Available at <http://www.hhs.gov/ocr/hipaa>
* Iannella R, and Sahama T, [Privacy Oriented Access Control for Electronic Health Records](http://www.ejhi.net/ojs/index.php/ejhi/article/view/265), Special Issue on e-Health Informatics and Security, *electronic Journal for Health Informatics* 2014;8(2),e15.

### Background on XML, Medical Standards, HL7 standard and Confidentiality

### Shortliffe Chapters 7 and 10

### Course Web Site (PDFs and PPTs)

### <https://www.w3.org/XML/> and <http://www.w3.org/XML/Schema>

### The Health Level Seven (HL7) Standard. Available at: <http://www.hl7.org/>

HL7 Version 3 - Value sets using code system: Confidentiality [2.16.840.1.113883.5.25]. Available at:

* <http://www.hl7.org/documentcenter/public_temp_5969D197-1C23-BA17-0C1ADD88E2E4CEBD/standards/vocabulary/vocabulary_tables/infrastructure/vocabulary/vs_Confidentiality.html>
* HL7 Confidentiality Definitions. Available at: [http://www.hl7.org/documentcenter/public\_temp\_F7525D5D-1C23-BA17-0C9A9B2F4EEFA395/standards/vocabulary/vocabulary\_tables/infrastructure/vocabulary/Confidentiality.html - L](http://www.hl7.org/documentcenter/public_temp_F7525D5D-1C23-BA17-0C9A9B2F4EEFA395/standards/vocabulary/vocabulary_tables/infrastructure/vocabulary/Confidentiality.html#L)
* Guide to the HL7 Healthcare Privacy and Security Classification System (HCS) May 2013 HL7 Informative Guidance Release 2. Available at: <https://www.hl7.org/documentcenter/public_temp_57724ED9-1C23-BA17-0CB16856B7F6E33F/wg/secure/3.%20HCS%20Guide%20Final%202013%200322%20JMD.pdf>
* OASIS eXtensible Access Control Markup Language (XACML) TC. Available at: <https://www.oasis-open.org/committees/xacml/>
* National Center for Health Statistics, Centers for Disease Control and Prevention. *Data Security and Confidentiality Guidelines for HIV, Viral Hepatitis, Sexually Transmitted Disease, and Tuberculosis Programs 2011*. Available at: <https://www.cdc.gov/nchhstp/programintegration/docs/PCSIDataSecurityGuidelines.pdf>
* Centers for Disease Control and Prevention. *Notifiable Disease Reporting with Certificates of Confidentiality 1991*. Available at: <https://www.cdc.gov/od/science/integrity/confidentiality/disease.htm>

### Lattice-based and mandatory Access Control

* Denning DE. [A Lattice Model of Secure Information Flow](http://www.cse.psu.edu/~trj1/cse543-f13/docs/denning_lattice.pdf), *Communications of the ACM* 1976;19(5):236-243.
* Bell DE, LaPadula LJ. [*Secure Computer Systems: Unified Exposition and Multics Interpretation*](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB8QFjAAahUKEwjI4bKfiJ_HAhVMpR4KHRkMD-Q&url=http%3A%2F%2Fcsrc.nist.gov%2Fpublications%2Fhistory%2Fbell76.pdf&ei=nuLIVciaFczKepmYvKAO&usg=AFQjCNGT0I7ZSfBl7iXYF68gLxbICS0ZZA&bvm=bv.99804247,d.dmo). MTR-2997 Rev. 1, MITRE Corp., Bedford, MA, March 1976.
* Lockheed Martin Cross Domain Cyber Solutions. Accessible at: <http://www.lockheedmartin.com/us/products/tman.html>
* Landwehr CE, [Formal Models for Computer Security](http://dl.acm.org/citation.cfm?id=356852), *ACM Computing Surveys* 1981;13(3):247-278.
* Sandhu R. [Lattice Based Access Control Model](http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=241422), *IEEE Computer* 1993;26(11):9-19.
* Department of Defense. *Department of Defense Trusted Computer System Evaluation Criteria* 15 August 1983;23. Available at: <http://csrc.nist.gov/publications/history/dod85.pdf>
* Smith GW. [The Modeling and Representations of Security Semantics for Database Applications](http://dl.acm.org/citation.cfm?id=100862). Doctoral Dissertation, George Mason University, 1990.

### Review of Other BMI Domain Knowledge and Concepts

### Shortliffe Chapters 4 and 5

### IEEE Computer, Volume 43, Issue 10, October 2010: [Mining Electronic Health Records](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5604166), Ramakrishnan, N.  Hanauer, D.  Keller, B., 77 - 81

### ASIDE: Other chapters of note that may be of interest for Project 2 this semester are: Chapter 5 (Cognitive science & BMI), Chapter 8 (NLP and BMI), Chapter 9 (Imaging and BMI)