

Albert Hoenigmann

Topic: Design Patterns

A design pattern is a description of a pattern observed in the design of software. Design patterns facilitate design by capturing design concepts and providing a way to easily communicate them. Design concepts are captured by associating a pattern in a design with a description and name for the pattern observed, then sharing the pattern through literature with the community that uses design patterns. Easy communication of design patterns is due to the agreed upon name and description of a design pattern by the community. Using design patterns promotes the reuse principle. Reuse and easy communication in the design process contributes to better software engineering.

The presentation will define a design pattern, give a rationale for using design patterns in software engineering, describe some of the most common design patterns and show how these design patterns are used in the object oriented design phase. The patterns to be presented have not yet been decided. The order the patterns will be presented in will be from the most to least intuitive. The intuitive elements of the UML will be used to aid in describing patterns and show how patterns are used in the design phase. Using only the most basic and intuitive elements of UML will allow peers who have not taken Object Oriented Design and Programming to follow the presentation. At least one concrete example of a pattern implementation will be demonstrated in the Java programming language. If it is necessary or time permits a brief history of design patterns including the key contributors in the field will be provided.

As the main goal of my presentation, I would hope to influence my peers to learn more about design patterns and use them in the organizations they will work in.

References

Astrachan, O., Mitchener, G., Berry, G., Landon, C. March 1998. Design Patterns: an essential component of CS curricula. In *Proceedings of the Twenty-Ninth SIGCSE Technical Symposium on Computer Science Education*. ACM Press, Atlanta, 153-160.

Beck, K., Crocker, R., Meszaros, G., Vlissides, J., Coplien, J.O., Dominick, L., Paulisch, F. March 1996. Industrial Experience with design patterns. In *Proceedings of the Eighteenth International Conference on Software engineering*. IEEE Computer Society, Berlin, Germany, 103-114.

Larman, C. 2002. *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process*. Prentice Hall PTR, Upper Saddle River, New Jersey.

Gamma, E., Helm, R., Johnson, R., Vlissides, J. 1995. *Design Patterns: Elements of Reusable Object-Oriented Software*. Addison Wesley Longman, Reading, Massachusetts.

Schmidt, D. Using design patterns to guide the development of reusable object-oriented software. *ACM Computing Surveys*. December 1996. ACM Press, New York, New York, Volume 28, Article No. 162.

Shalloway, A., Trott, J. 2002. *Design Patterns Explained: A New Perspective on Object-Oriented Design*. Addison Wesley, Upper Saddle River, New Jersey.