AIFB

**Bachelor-/Master-Thesis at the „Beijing Institute of Technology"**

Location-Aware Document Access with a Cloud-Based Webapplication

The approach of *Location-Aware Document Access (LADA)* means that access to electronic documents is only granted when the user is located to currently stay within a particular place. For example, if a document concerning a pending patent is created on the company's premises, then it could be enforced that this document cannot be accessed outside this company's premises. The user's current location evaluated for the *access control decision* can be obtained by employing locating systems like GPS or WLAN-positioning. Using LADA can help to tackle the security and usability issues that come along with mobile computing. For this thesis LADA has to be implemented as a web-application based on *Cloud Computing (CC), Java Servlet Technology* and *HTML5's Geolocation feature*.

The basic idea of CC is to obtain virtualized computer resources like data storage or computation over the internet; these resources are provided according to the principles of utility computing, i.e., only the amount of resources actually used has to be paid and the resources are booked in a "self-service" manner. There are three basic variants of CC, namely *"Software-as-a-Service" (SaaS)*, *"Platform-as-a-Service" (PaaS)* and *"Infrastructure-as-a-Service" (IaaS)*; for the webapp to be developed PaaS should be employed, i.e., a complete runtime environment provided as Cloud-Service with special APIs/libraries and development tools will be used, e.g., Google App Engine.
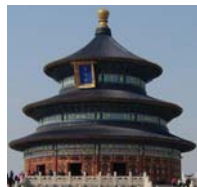
If the topic is chosen as master thesis, then the HTML produced by the webapp has to be compliant to "XHTML Mobile Profile" and tested with mobile-specific tools (e.g., mobile phone emulators). Further, a master thesis also includes a systemic search for an appropriate PaaS provider and an elaborated literature survey on the aspects relevant for this topic, e.g., location-based services and CC with mobile computers.

The thesis has to be (at least partially) written during a stay at the *"Beijing Institute of Technology" (BIT)* in the PR China, but it will be marked solely by the AIFB. During the stay at the BIT the thesis will be supervised via telephone/internet communication from the AIFB in addition to the local supervisors. No skills in the Chinese language are required, but good English for the communication with the local supervisors and for writing the thesis.

If you are interested, then please contact: *michael.decker(at)aifb.uni-karlsruhe.de,* Forschungsgruppe Betriebliche Informationssysteme (BIS, Prof. Oberweis)

Literature for getting started:

- P.J. Brown: The stick-e document: a framework for creating context-aware applications. Electronic Publishing, Vol. 8, No. 2&3, 1995, pages 259-272.

- M. Decker: Ortsabhängiger Dokumentenzugriff mit Discretionary Access Control. In: Proceedings zur 5. Konferenz Mobile und Ubiquitäre Informationssysteme (MMS 2010), Göttingen, 153-166.

- J. Hunter: Java Servlet Programming (2nd Edition). O'Reilly, Beijing et al., 2001.

- C. Baun, M. Kunze, J. Nimis, S. Tai: Cloud Computing: Web-basierte dynamische IT-services. Springer-Verlag, Berlin & Heidelberg, 2011.

- K. Roche, J. Douglas: Beginning Java App Engine. Apress,   Berkeley, Calif., 2009.

- M. Pilgrim: Chapter 6 on "Geo-Location" in: HTML5 – Up and Running. O'Reilly, Sebastopol, CA, USA, 2010, pages 117-126.

- "Geolocater": Plugin for Firefox to simulate arbitrary positions for HTML-Geolocation. https://addons.mozilla.org/de/firefox/addon/geolocater/

Additional literature if this topic is chosen for a master thesis:

- M. Firtman: Programming the mobile web. O'Reilly, Beijing (China) & Köln (Germany), 2010.

- M. Bieh: Mobiles Webdesign: Konzeption, Gestaltung, Entwicklung. Galileo Computing, Bonn, 2008.

- M. Satyanarayanan, P. Bahl, R. Caceres, D. Nigel: The Case for VM-Based Cloudlets in Mobile Computing. IEEE Pervasive Computing, Vol. 8, No. 4, 2009, pages 14-23.

- B.-G. Chun, P. Maniatis: Augmented Smartphone Applications Through Clone Cloud Execution. In: Proceedings of the 12th Workshop on Hot Topics in Operating Systems (HotOS '09), Monte Verita, Switzerland, 2009.