OPEN APEREO 2022

UniTime Around the World

Zuzana Müllerová, Tomáš Müller

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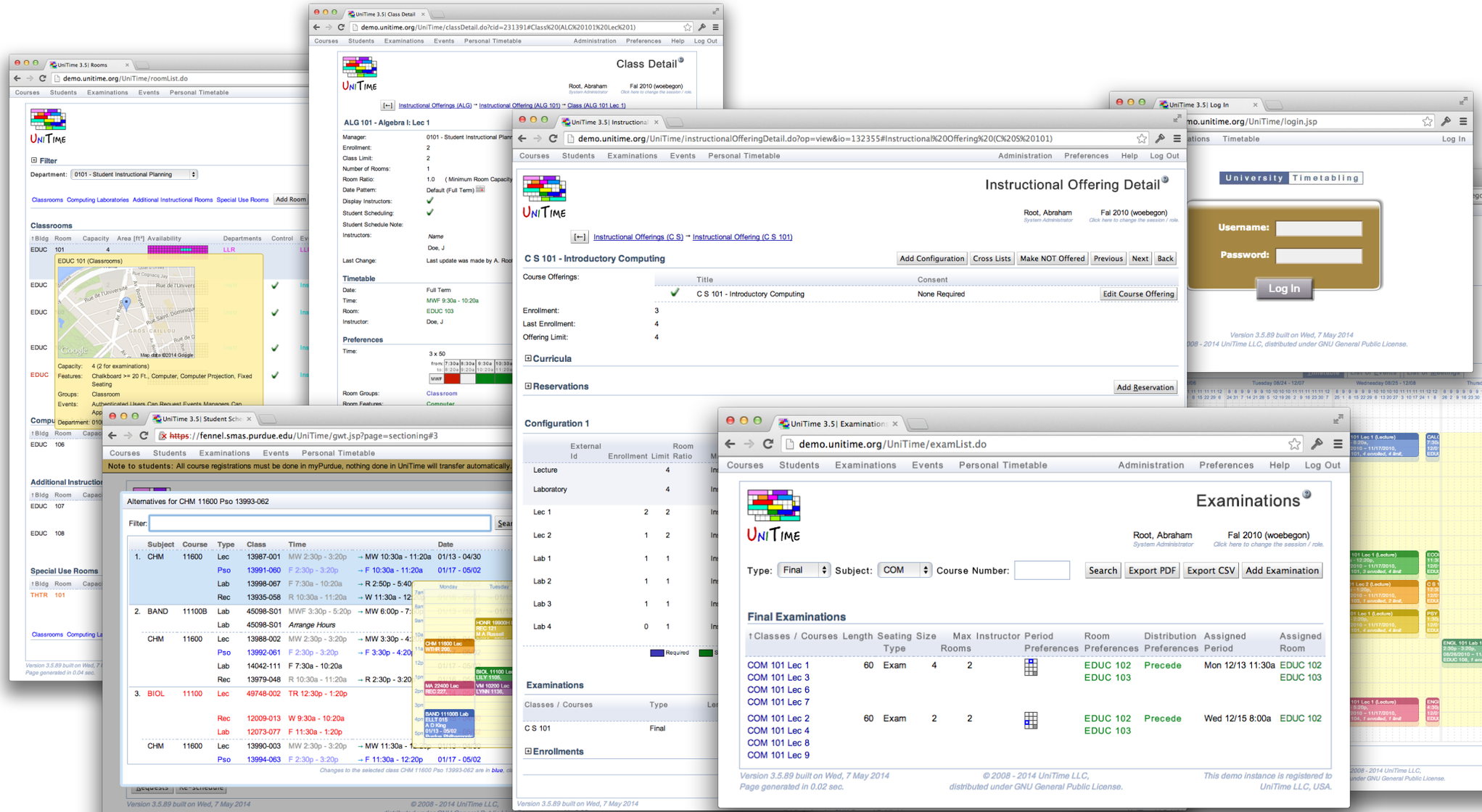
Introducing UniTime

What is UniTime?

- Comprehensive academic scheduling solution



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Introducing UniTime

What is UniTime?

- Comprehensive academic scheduling solution
- Five components

1. Course Timetabling

2. Examination Timetabling

5. Event Management

4. Instructor Assignment

3. Student Scheduling

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UniTime Users

World cloud

- Over 500 voluntary registrations
- 97 institutions have indicated that they use UniTime in production
- 45 new registrations during the last 12 months
- Many use a localized version of UniTime

as of May 2022

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Why UniTime

Why use UniTime?

- **UniTime solves the timetabling and scheduling problems**
  - Use resources effectively
  - Help students graduate in time, keep tuitions low
  - Adapt to changes
  - Plan the future and test what-if scenarios
- **Open source solution, free to download**
  - Using other open source projects (Java, Tomcat, …)
  - Source code kept and maintained on GitHub
  - Nightly builds available for download
  - Changes requested by schools contributed back to the project
  - Programmed with versatility in mind
  - Possibility for users to localise UniTime and contribute back
- **Commercial support available if needed**

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Examples - Purdue University

Purdue University

- Main contributor of UniTime, uses all components
- Regular classes 3x50 or 2x75 for the whole semester
- Student scheduling/registration for around 49k students
- Final and evening exams
- Event management for all classrooms, and some other spaces

Challenges

- Centrally timetabled large lecture rooms, and computing labs
- Coordinate the timetabling between ~70 departments
- Shared classrooms
- Pre-registration and batch scheduling for ~35k undergraduate students
- Size ~3,000 courses with 9,200 timetabled classes and 1,200 final exams
- Learning communities
- Enrollment projection simulations
- Large setup using three web servers and two solver servers

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Examples - Purdue University

Integration with other systems

- Student Information System
  - Real-time interface with Elucian Banner
  - Using Banner XE APIs (students) and custom code (courses)
- Learning Management
  - Through Banner (D2L Brightspace)
- Registration override workflow system
  - Made at Purdue, using custom APIs (UniTime calling the other system)
- Degree Planning
  - Using DegreeWorks, in process of being replaced by EduNav
- Various reporting, other custom apps, etc.
  - Using UniTime's RESTful JSON APIs
  - And its reporting and scripting abilities

See "How Purdue University has Benefited from the Use of UniTime and Open Source Practices" by Stephanie Schluttenhofer at 11:50am for more information

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Examples - Masaryk University

Masaryk University

- Course Timetabling & Event Management
- 7 faculties out of 10 use UniTime

Faculty of Education

- Around 5 000 students
- Both present and combined form of study
- Challenges
  - Double majors - many different combinations
  - Teacher constraints (e.g., 6 hours of classes within 8 hours work day)
- Contributions to UniTime
  - Curriculum timetabling
  - Alternative sets of weeks for classes
    - E.g. odd / even weeks - UniTime chooses which ones

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Examples - Masaryk University

Faculty of Sports

MUNI

- Around 2 000 students
- Challenges
  - Shared classrooms, sport facilities are spread around the town
    - Contribution to UniTime: Travel times
  - Combined study
    - Strictly follow curricula - no student conflicts allowed
    - Covid: some weeks online, some weeks on site

Faculty of Informatics

- Around 2 000 students
- One building, present form of study (relatively simple)
- Challenge: Plans of study with many elective and optional courses
  - Solution: Combine curricula with students' pre-registration
- Contribution to UniTime
  - Original research, a number of published papers
  - ITC 2019

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Examples - Masaryk University

Faculty of Medicine

MUNI

- Around 3 000 students, both medical and non-med
- Challenges
  - New plans of study
  - New simulation center
  - Coordination of hospitals throughout the town for clinical classes
  - Planning and what-if scenarios
- Contribution: New distribution constraints

Integration with other systems

- Only the student information system
  - When setting up a new semester (one per each faculty)
    - From SIS to UniTime: UniTime's **XML interfaces**
  - Import of the seminar groups and the timetable to the SIS
    - From UniTime to SIS: **CSV files** generated by scripts

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Examples - APU

Asian Pacific University

- Course Timetabling & Event Management
- New concept for UniTime: Overlapping sessions (modules)
  - Classes are always in progress (no separate semesters)
  - A new session always timetabled on top of the existing ones
- Cohorts attending the same classes
  - Modelled using curricula and curriculum reservations

Challenges

- How to define an academic session?
- Changes to previous modules

Contributions

- Conflicts between overlapping academic sessions

Integration with other systems

- Custom scripts using UniTime's scripting abilities and APIs

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Examples - AGH

AGH University of Science and Technology

- Course Timetabling, Student Scheduling, Event Management
- Number of mostly-independent faculties
  - Each with two problems: courses/classes offered for their faculty and course/classes offered for students of other faculties
- Combination of curricula and pre-registration
  - Varies between departments

Challenges

- Coordination between faculties, student scheduling

Contributions

- Deterministic student scheduling with no student conflicts allowed
- Event meeting contacts, PostgreSQL, …

Integration with other systems

- UniTime's XML Interfaces and APIs

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Other Examples

Lahore University of Management Sciences, Pakistan

- Course Timetabling
- Custom interface with PeopleSoft using UniTime's XML interfaces

Turkish-German University, Turkey

- Course Timetabling
- Visiting faculty from Germany (always only for a few days)
- Students modelled using distribution constraints

Massachusetts Institute of Technology, USA

- Course timetabling with all times fixed (only assigning rooms)
- Student scheduling to avoid time conflicts
- Examination timetabling, plus timetabling of make up exams
- Custom integration using direct database access
- UniTime 3.4 (released 2013) with lots of their modifications

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Conclusion

UniTime Resources

- Website www.unitime.org
- Online Demo demo.unitime.org
- Manuals bit.ly/unitime46docs (or Help > Manuals in the app)
- Online Help help.unitime.org
- Research Publications www.unitime.org/publications.php
- Presentations www.unitime.org/presentations.php
- Webinars www.unitime.org/webinars.php
- GitHub github.com/UniTime
- Downloads & Nightly Builds builds.unitime.org
- Twitter @UniTimeOrg
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