UniTime: State of the Project

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Agenda

• Short introduction of UniTime
• State of the Project
• UniTime 4.2 (Current Version)
• UniTime 4.3 (New Version, to be released in June 2018)
• Plans for next release & long term

This presentation is available at www.unitime.org/present/apereo18-unitime.pdf
What is UniTime?

- Comprehensive academic scheduling solution
- Four components: course timetabling, examination timetabling, student scheduling and event management
- Open source, web-based, written in Java using modern technologies
- Using state-of-the-art optimization algorithms
- Distributed data entry and timetabling in multi-user environments
- Apereo project since March 2015
Releases / Achievements

• UniTime 4.2 released in June 2017
  • Instructor Scheduling, Mobile, Student Groups, Point in Time, Event Management
• UniTime 4.3 to be released in June 2018
  • Course Request Validation & Batch Student Scheduling
  • More to follow in this presentation…
• UniTime 4.4 specs are being defined
• 55 institutions from 33 countries filled our voluntary registration form during the last 12 months
• 63 institutions indicated that they use UniTime in production
• Steady increase in interest and adoption from literally around the world
  • But still very little outside contributions
• Both sides of the interface with Ellucian Banner are now available
Word cloud from our voluntary registrations (all of them)
International Timetabling Competition 2019

• To be announced at PATAT 2018 this August (winners at PATAT 2020)

• Course timetabling problem
  • Assignment of classes to times and rooms, students to classes
  • Course structure, classes with available times and rooms, student course demands, distribution constraints
  • Optimization: time and room penalties, (soft) distributions, minimization of student conflicts

• Based on real-life data collected using UniTime
  • Anonymized, a slightly simplified problem model
  • 10+ institutions from around the world

• Organization
  • Looking for best solutions, commercial solvers allowed, no time limit
  • Three groups of data will be published during the competition
  • Competition website with solution validator, best known results, etc.
UniTime 4.2

- Released June 2017
- Brand new Instructor Scheduling component
  - Automatic assignment of instructors (TAs) to classes
- Mobile-friendly user interface
  - Using responsive design
- Improved ability to keep students of a particular group together
  - Both course timetabling and student scheduling
- Point in time reports
  - E.g., census date limits & enrollment data
- Event Management
  - automatic approval, service providers, meeting contacts
- Many other improvements across the whole application

See https://goo.gl/4g1XQV (UniTime 4.2 Release Docs) for more details.
New Release: UniTime 4.3

UniTime 4.3

• To be released in June 2018
• Batch Student Scheduling
  • Custom Course Requests Validation
  • Scheduling Dashboard
• Course Timetabling
  • Solver pages rewritten to GWT
  • Improved localization and internationalization
  • A number of new features and improvements
• Scripting & Reporting
  • API, new parameters, Task Scheduler
• Many other improvements across the whole application

Batch Student Scheduling

- After a timetable is produced
- Using pre-registrations and student course demand projections
- To provide students with initial schedules
- An optimization process, using the (student scheduling) solver
- It is possible to iterate
  - With the ability to keep already enrolled students unchanged or to minimize changes
Course Requests

• Custom Validation eligibility, max credit, overrides
• Status Icons
• Print Confirmation
Student Scheduling Dashboard

- Advisor access
  - My Students, Change Status, Change Group
- More information
  - Overlaps, Distances
  - Request Credit
  - Alternatives
  - Student Details (requests, grid)
- Student statuses
  - Assistant / Request
  - Effective Dates
  - Fallback Status
Batch Student Scheduling

Student Scheduling Solver
  • Custom validation & overrides
  • Custom save (e.g., using Banner XE API to enroll students)
  • Short distances (for students with accommodation)
  • Student group types
    • Keep students together
    • Allow disabled sections (may require a group reservation)
  • Custom overrides
    • Ability to request time/space conflict when needed

<table>
<thead>
<tr>
<th>Code</th>
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<th>Keep Students Together</th>
<th>Disabled Sections</th>
<th>Advisors Can Set</th>
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<td>Not Allowed</td>
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<tr>
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<td>Allowed With Group Reservation</td>
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<tr>
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<td>STAR Students</td>
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<td>✗</td>
</tr>
</tbody>
</table>
Course Solver Pages

- Rewritten to GWT
- Localizable, First day of week
- Customizations
- New Features
- Filter on Suggestions page
- Export to Excel
Reporting

- New parameters for HQL reports
- Report API
Scripts

- Send email when done
- Clustering
- Script API
- New parameter types (e.g., time, date, or timestamp)
- Automation
Other Improvements

- Added ability to use OpenStreetMap
- Course Offering XML: create if not exists
- Course Requests XML: add / drop requests
- Test HQL: Export CSV, table formatting & pagination
- Instructor API: export instructor preferences
- Room Availability: include events from other academic sessions
- Events: first day of week can be changed
- New manuals (see Help > Manuals)
- Branding (using custom CSS)

…
Next Release: UniTime 4.4

UniTime 4.4

• Planned release: mid 2019

• TBD, most likely student scheduling
  • Ability to request pairs of courses
  • Avoid/minimize online courses
  • Interfaces, student schedule quality / fairness, …

• Continue the effort of making the user interface look & feel more modern, mobile friendly, and better localizable
Conclusion

Long Term

• Constraint Solver: instructor and student scheduling, team building
• UI: moving from Struts to GWT, localization, documentation, mobile
• Interfaces: IMS Course Planning & Scheduling, more APIs and XMLs

For more details, please see us at the conference

• Getting Started with UniTime (Sunday, 9 am in Liszt)
• UniTime: State of the Project (Monday, 2:30 pm in Debussy)
• UniTime Introduction (Monday, 5:30 pm, Showcase Reception)
• Student Scheduling at Purdue University (Tuesday, 11:15 am in Debussy)
• Internationalization of UniTime (Wednesday 11:00 am in Debussy)

• Or visit www.unitime.org

An online demo is available at https://demo.unitime.org