Computer-based Analysis and Visualization of Collaborative Learning Activities (CAViCoLA)

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CAViCoLA ERT

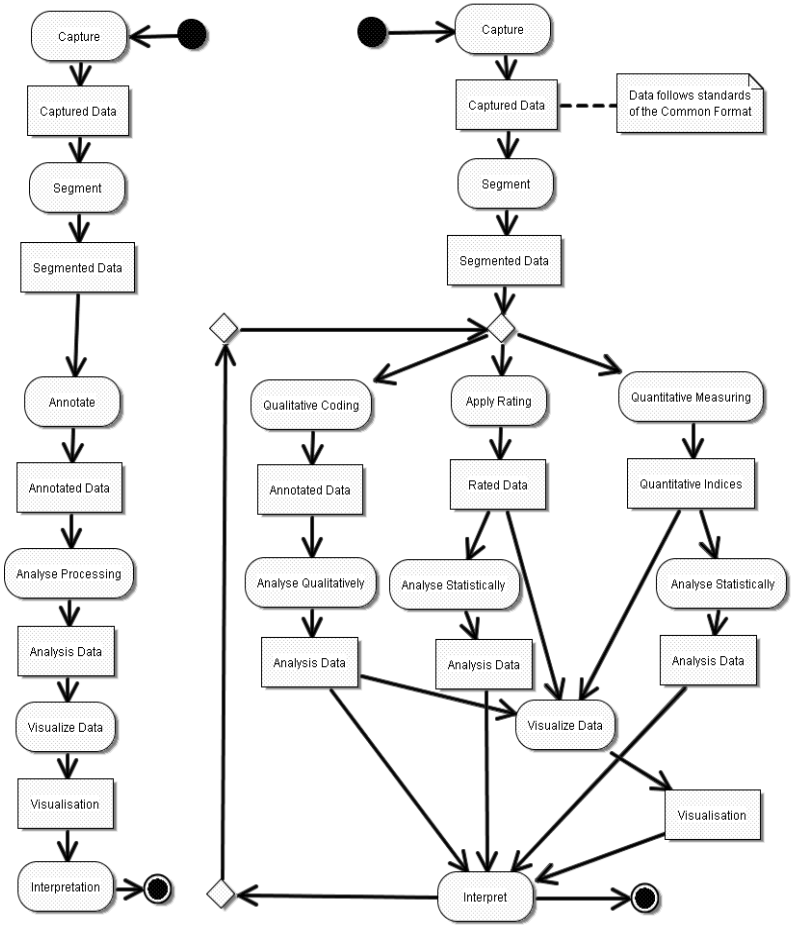
Cavicola ERT composition

- **ERT Leader**
  - Andreas Harrer, University Duisburg-Essen – DE
- **Steering committee**
  - Andreas Harrer, University Duisburg-Essen – DE
  - Nikolaos Avouris, University Patras - GR
  - Yannis Dimitriadis/Alejandra Martinez, University Valladolid – E
  - Nikol Rummel/Hans Spada, University Freiburg- DE
- **Consortium**
  - *University Duisburg-Essen – DE*
  - *University Patras – GR*
  - *University Valladolid – E*
  - *University Freiburg – DE*

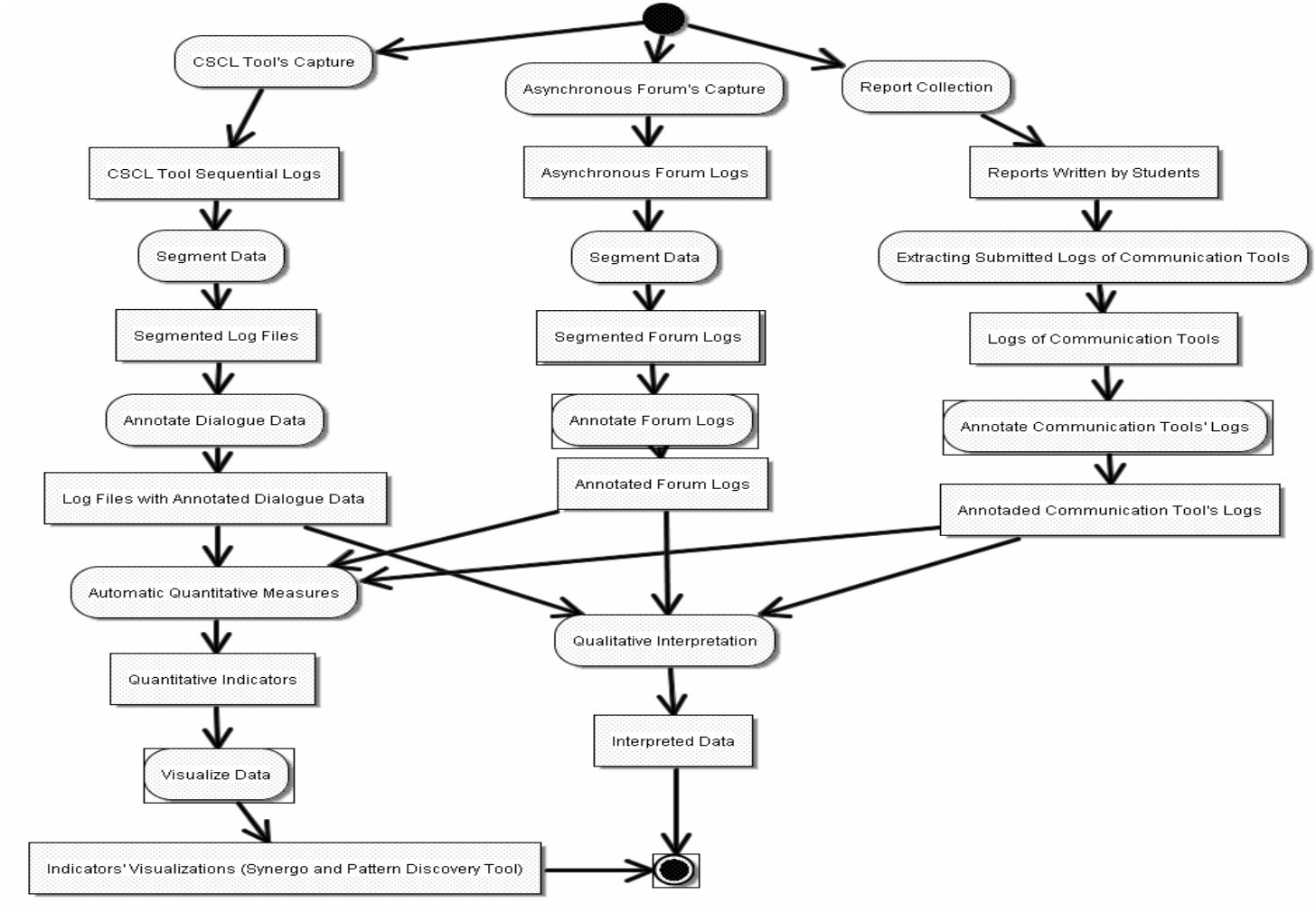
Background and objectives

- Reinforce existing strong bonds to previous and current projects (JEIRP) within Kaleidoscope
  - E.g. Duisburg and Valladolid teams participated in IA, ICALTS (and CCI-IA)
- Establish and consolidate existing common and complementary work among ERT teams
- Create and disseminate knowledge within the Kaleidoscope and TEL communities
  - Proposal of a new integrated process model for IA
  - Setup of new single-site and cross-site case studies
  - Creation of visualization techniques and tools
  - Cross analysis of IA data using coding schemes, common data format and tools

CAViCoLa process model



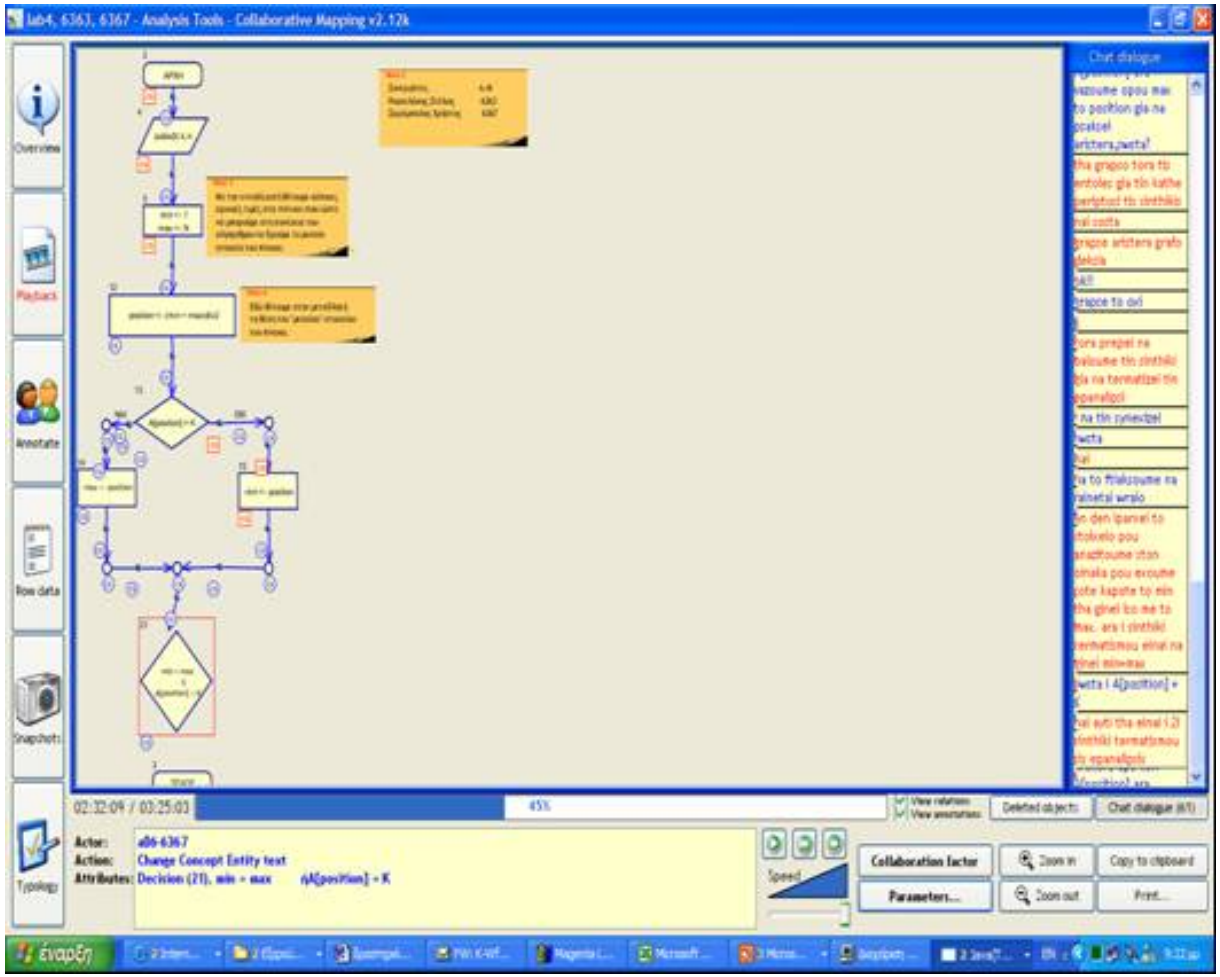
Cross-site studies (Patras-Duisburg)



Cross-site studies (Freiburg-Patras I)

- Adaptation of rating scheme
  - rating tool originally developed by Freiburg team (Meier, Rummel, & Spada, 2007) successfully adapted to fit the data from the Patras team‘s studies with Synergo (Avouris, Margaritis, Komis, 2004)
  - result: new rating handbook, illustrated with examples from Patras case studies; collaboration quality assessed on six dimensions
- Joint experiment
  - goal: use rating tool as the basis for giving adaptive feedback to students with the help of a feedback scheme
  - adaptive feedback implemented in students’ regular courses, in the framework of a joint experiment (currently run in Patras)

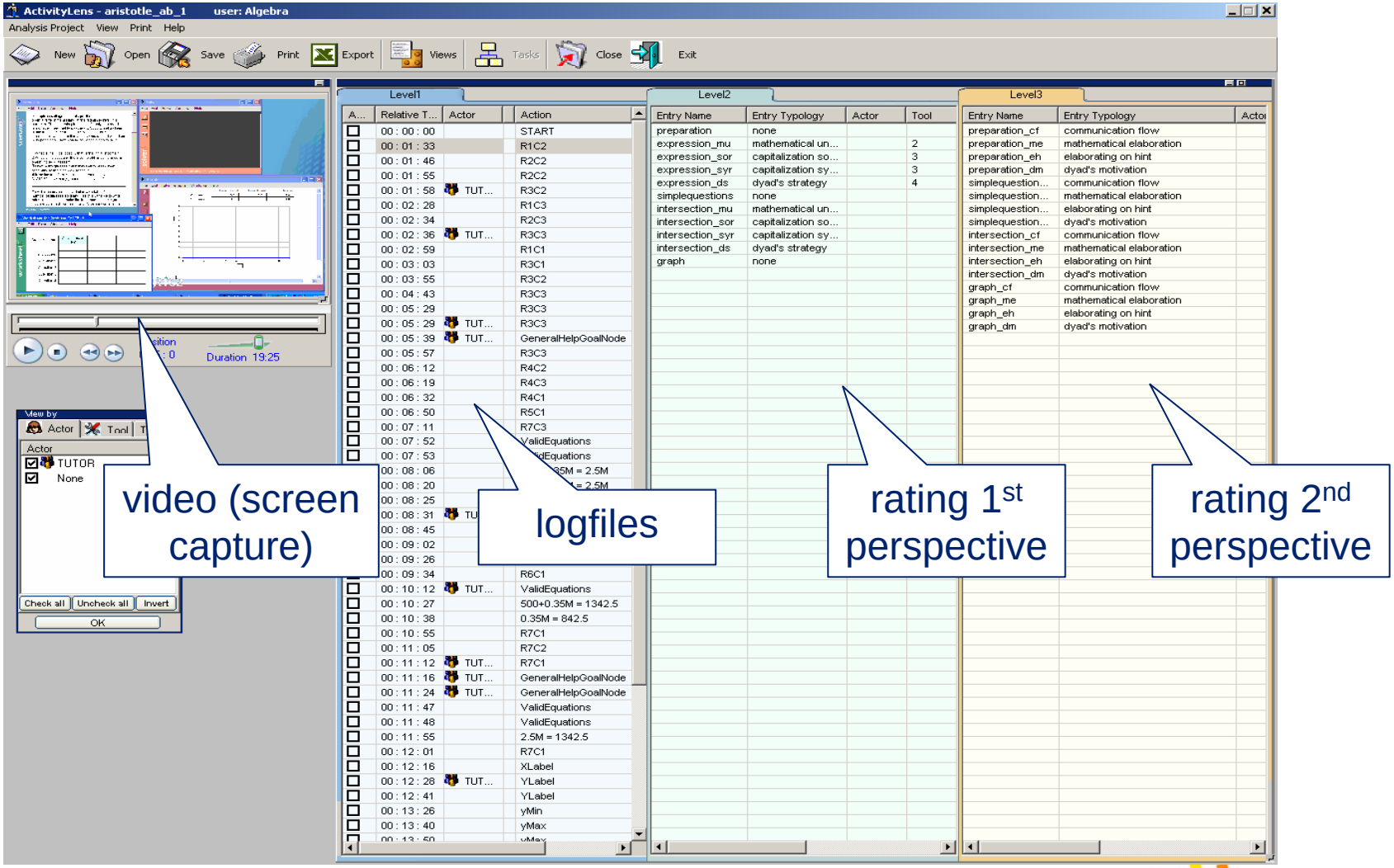
Algorithm building activity using Synergo



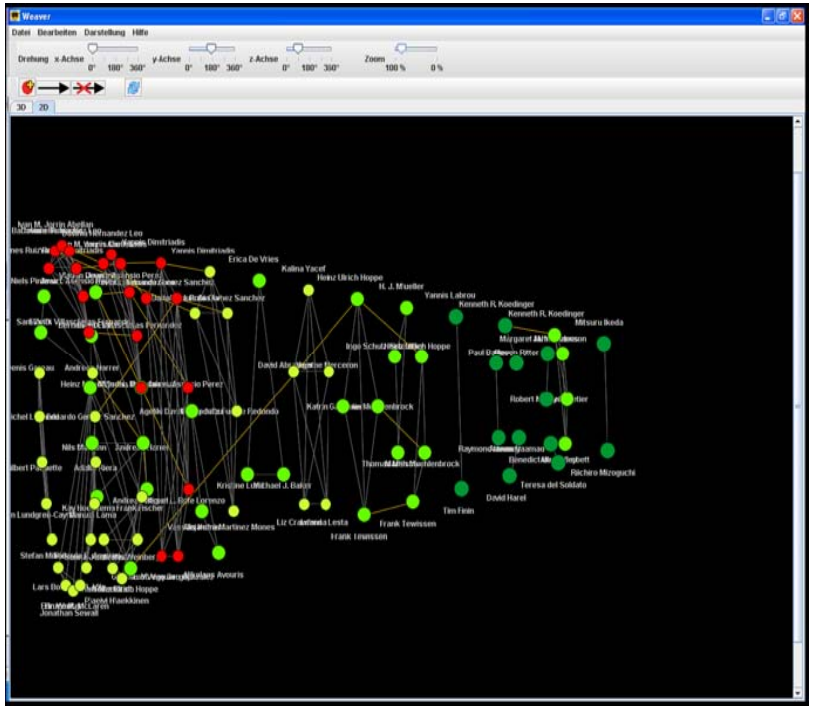
Cross-site studies (Freiburg-Patras II)

- application of ActivityLens (Avouris et al., 2007) to analyze data from Algebra project (Diziol et al., 2007)
  - development of a rating scheme that evaluates students‘ collaboration in mathematics from two different perspectives
  - restructuring of activities’ dataset and modifications to ActivityLens tool enabling the integration of the rating scheme
- outcome
  - ActivityLens was successfully adapted to be used for interaction analyses based on a rating scheme
  - as the interaction analysis of 10 dyads shows, the developed rating scheme reliably assesses students‘ interaction

Screenshot of analysis with ActivityLens

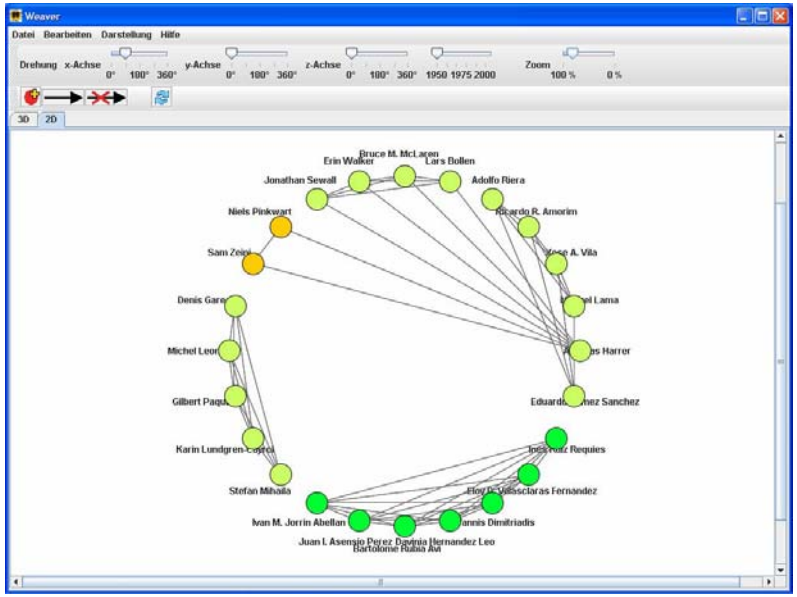


Visualization techniques and tools (Weaver: community and time info)



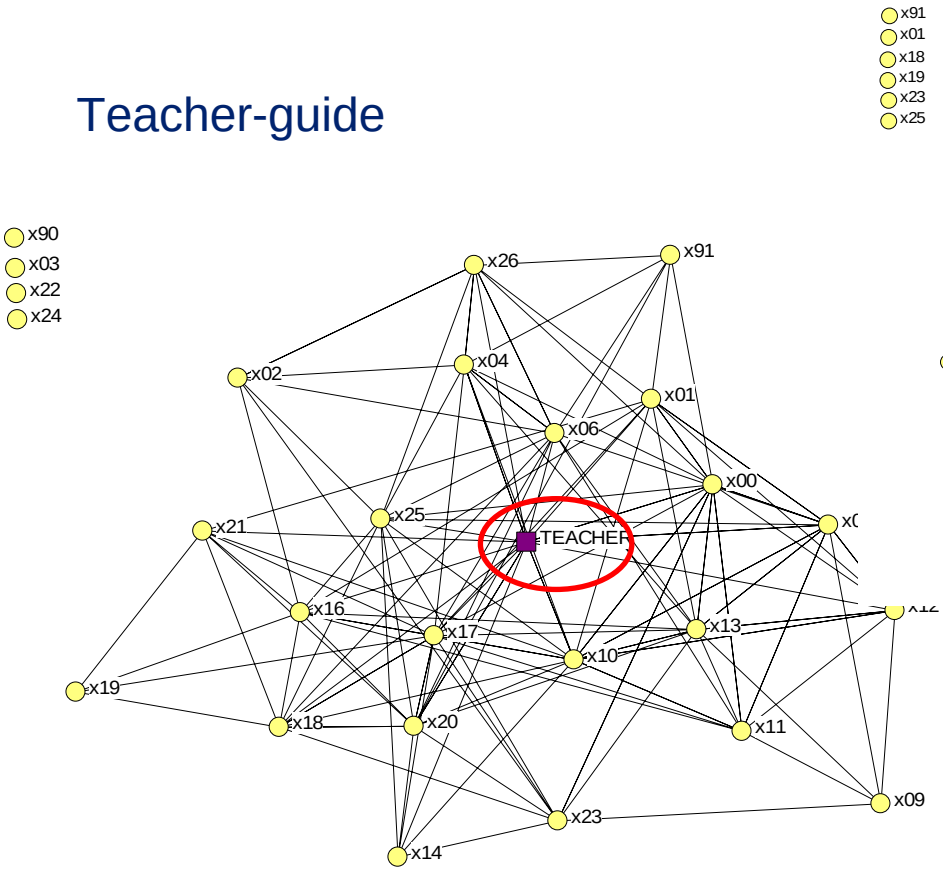
The authoring network in a timeline

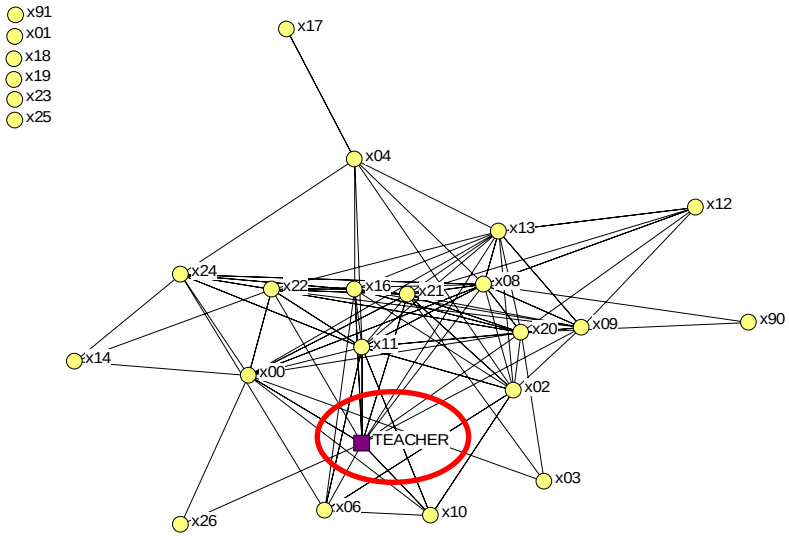
Projection into one time-slice using a filter



Visualization techniques and tools (Samsa: Role detection)

Teacher-guide

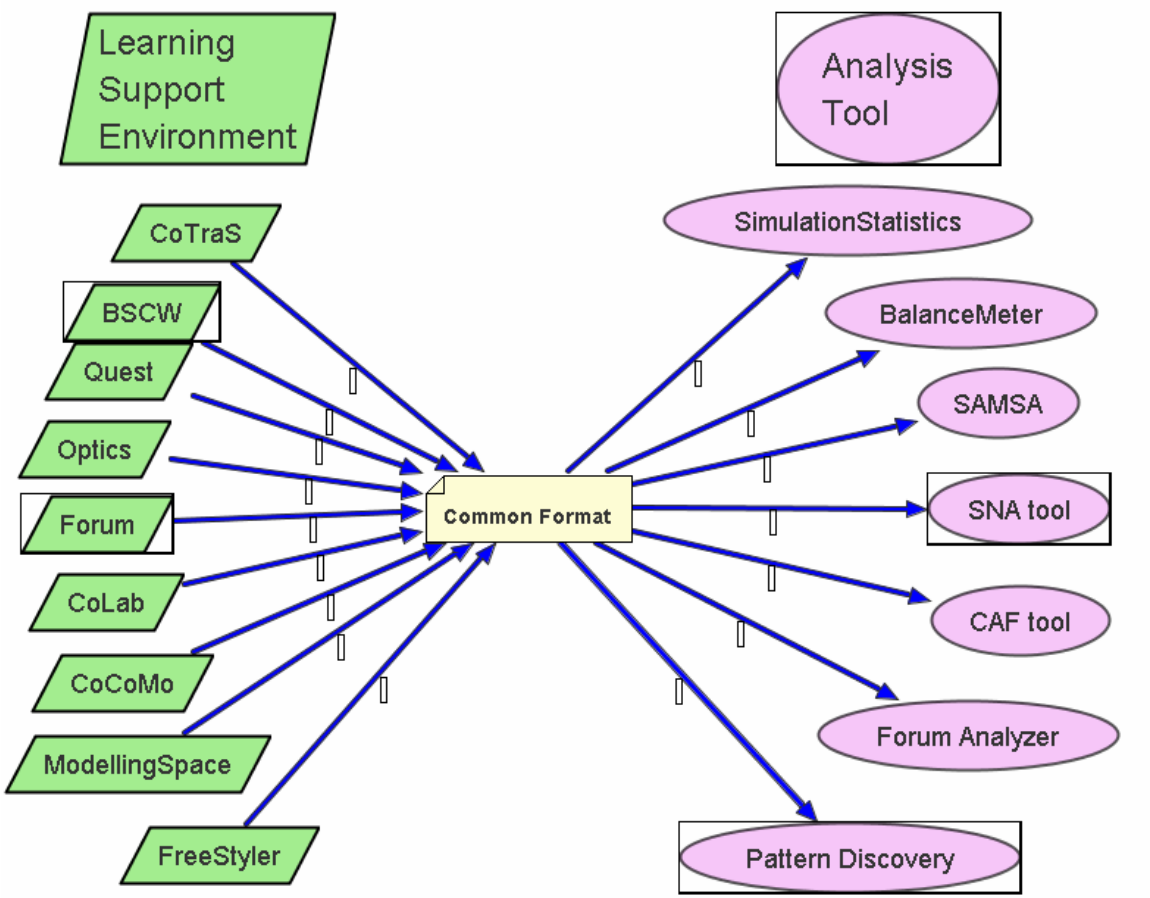




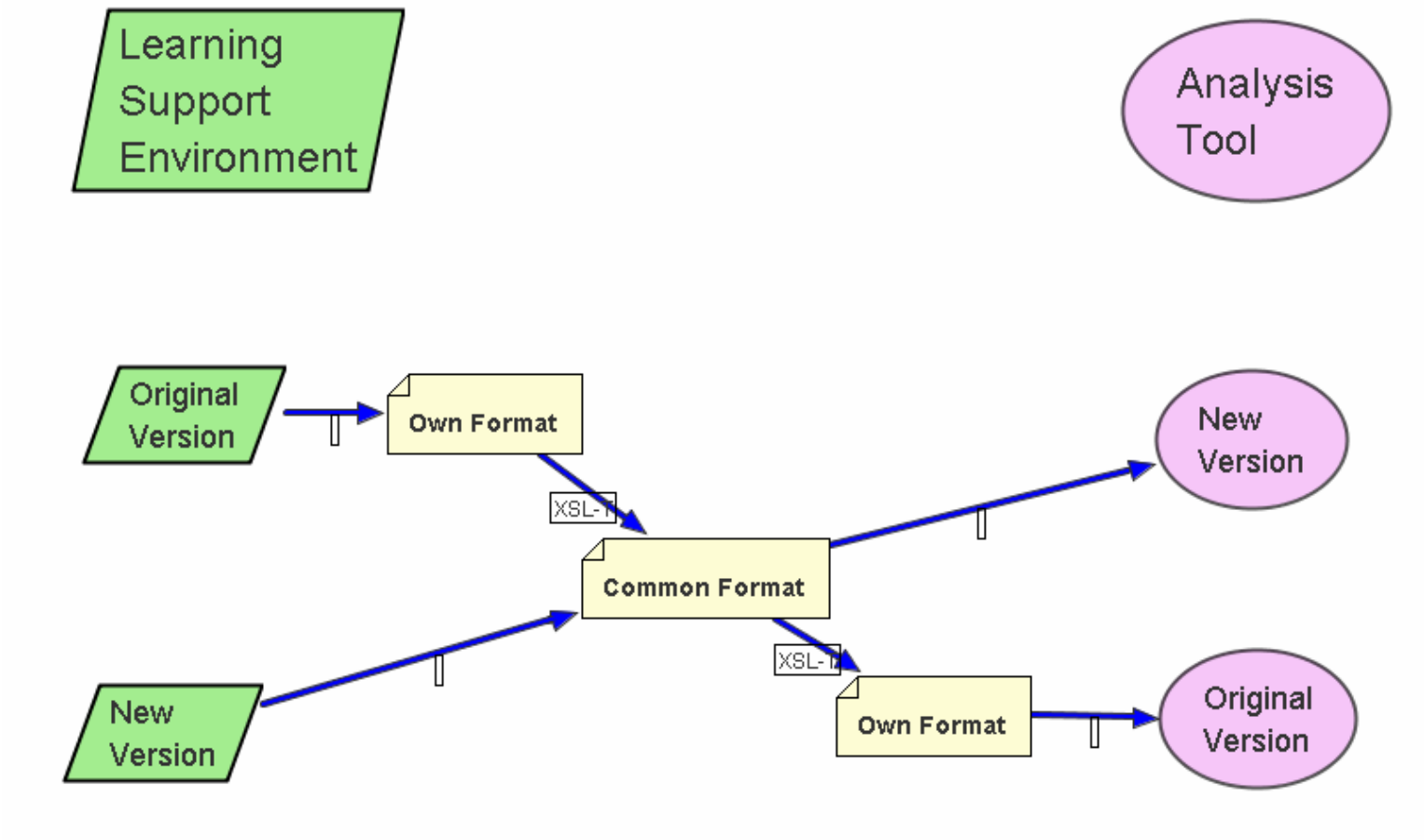
Teacher-collaborator

kaleidoscope

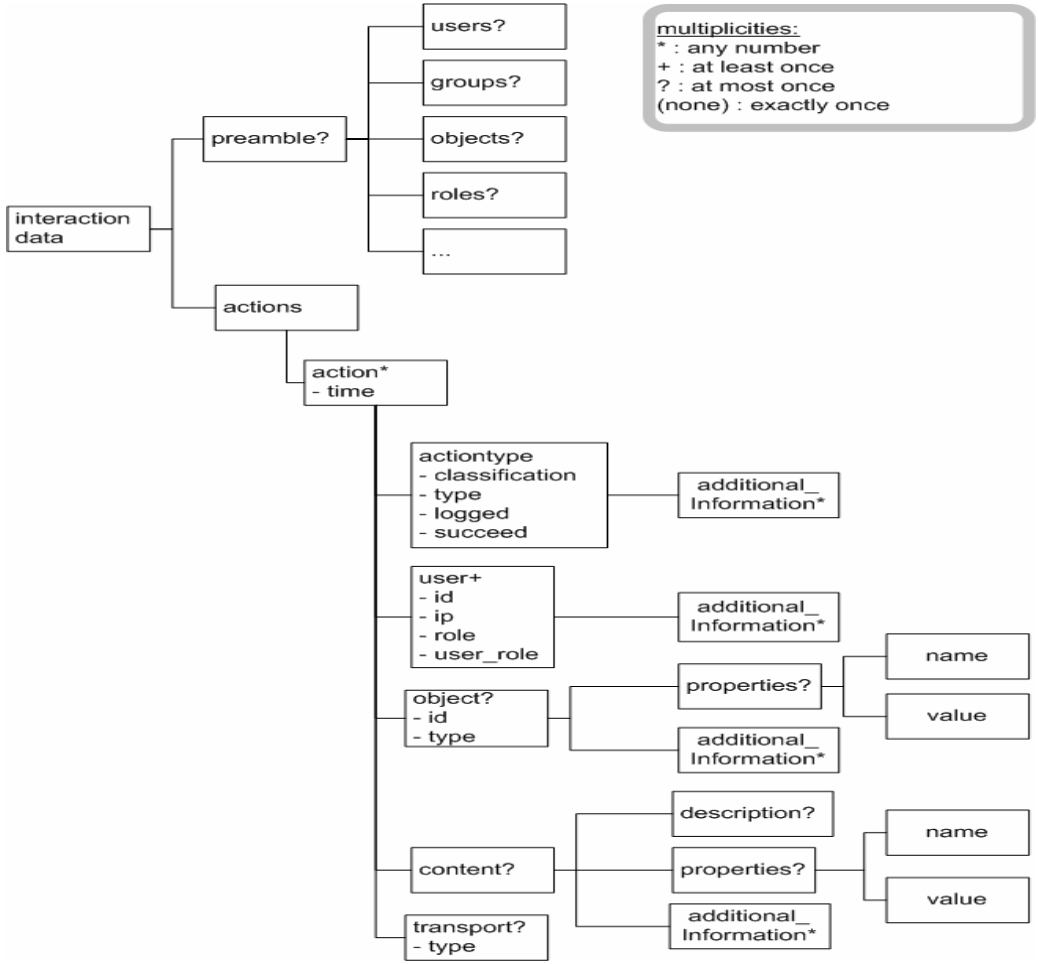
Coding data format and interoperable tools (I)



Coding data format and interoperable tools (II)



Coding data format and interoperable tools (III)



Lessons learned and future directions

- **Interoperability and common process models**
  - **Need for common understanding and data-tool sharing**
- **Case studies**
  - **Real-life use of IA tools that provides evidence for their usefulness**
- **Visualization**
  - Flexible tools for effective use
  - Importance of SNA representations

A sample of CAViCoLa publications

- **Cavicola Process model**:
  - Harrer, A., Zeini, S., Kahrimanis, G., Avouris, N., Marcos, J.A., Martínez-Mones, A., Meier, A., Rummel, N., Spada, H. (2007) "Towards a Flexible Model for Computer-based Analysis and Visualization of Collaborative Learning Activities", CSCL 2007, New Brunswick, July 2007

- **Duisburg-Patras cross case study**:
  - Harrer, A., Kahrimanis, G., Zeini, S., Bollen, L., Avouris, N. (2006) "Is there a way to e-Bologna? Cross-National Collaborative Activities in University Courses", EC-TEL 2006, Crete, October 2006 (LNCS 4227)

- **Visualization tools:**
  - **Weaver**: Harrer, A., Zeini, S., Ziebarth, S., Münter, D. (2007): "Visualisation of the Dynamics of Computer-mediated Community Networks", International Sunbelt Social Network Conference 2007
  - **Activity Lens:** Avouris, N., Fiotakis, G., Kahrimanis, G., Margaritis, M. & Komis, V. (2007). "Beyond Logging of Fingertip Actions: Analysis of Collaborative Learning Using Multiple Sources of Data". Journal of Interactive Learning Research. 18 (2), pp. 231-250
  - **Samsa tool and role detection:** Marcos,J.A., Martínez, A., **Dimitriadis, Y.,** Anguita, R., "*A role framework for interactions analyis-based support of collaborative learning activities*", e-Services Journal, 5 (2008)

- **Freiburg-Patras cross case studies:**
  - Meier, A., Voyiatzaki A., Kahrimanis G., Rummel, N., Spada, H., Avouris,N. (2008). Teaching students how to improve their collaboration: Assessing collaboration quality and providing adaptive feedback in a CSCL setting. Submitted as part of the symposium "New Challenges in CSCL: Towards adaptive script support" (Nikol Rummel and Armin Weinberger), ICLS 2008, Utrecht, June 2008
  - Diziol D., Rummel N., Kahrimanis G., Guevara G., Holz J., Spada H., Fiotakis, G. (2008). Using contrasting cases to better understand the elationship between students? interactions and their learning outcome. Submitted as part of the symposium "Using contrasting cases to relate collaborative processes and outcomes in CSCL" (Nikol Rummel and Cindy Hmelo-Silver) ICLS 2008, Utrecht, June 2008

- **Dissemination**:
  - Cavicola Workshop, CSCL SIG, Kaleidoscope Alpine Rendevous, Villars, Alpes, January 2007