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Gene-Auto development status and support

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Status after the Gene-Auto ITEA project

WP2 objectives

- Toolset architecture definition
  - Achieved
- Design and implement functionality for code generation
  - Achieved
- Design and implement functionality for formal model verification
  - Withdrawn from user requirements
- Ensure DO178B/ED12B-compliant development process and keep lifecycle data record for qualification
  - Partly achieved

Gene-Auto toolset

- One-step code generation from Simulink, Stateflow and Scicos models
- Open customisable architecture
- Open-source toolset to ensure long-term maintainability
- Generates ISO/IEC 9899 and MISRA compatible C code for embedded systems
- Usage of formal methods in selected transformation steps (WP5)
- Open intermediate languages for model exchange.

Simulink support

- Selected subset of supported blocks
  - 42 native Simulink blocks, 15 custom blocks
  - Easily extendable
- Support of multirate models
- Support of explicit scheduling via ‘function-call’ triggering
- Native support for matrix and vector operations
- Limited EML (Embedded Matlab) support in expressions
  - EML blocks not supported
  - Matlab functions not supported
- Modelling restrictions apply to ensure compatibility and chosen quality rules (D1.13)

Stateflow support

- Code generation from Stateflow
  - charts – supported
  - graphical functions – supported
  - “classical” truth tables – supported
  - EML (Embedded Matlab) truthtables – not supported
  - EML functions – not supported
- Modelling restrictions apply to ensure safety and chosen quality rules (D1.14)

Scicos support

- Scicos/Gene-Auto interface implemented in Scicos
  - Specific Scicos pallet compatible with the supported subset of Simulink blocks
  - Full user interface integration
  - Automated simulation support of the generated code
- Gene-Auto launcher
  - Reads the Scicos model stored in the GASystemModelling language and executes the required Gene-Auto elementary tools

“Qualification kit“

- Development plans
- Development data
  - High-level: Toolset requirements
  - Low-level: Tool requirements (each elementary tool)
  - Design
  - Source code
- Verification data
  - Requirement verification data
  - Design verification data
  - Code verification data
- User documentation
- Templates for qualification plan

Developments in 2009

Developments in 2009

- Maintenance for Airbus France and EADS Astrium
  - 20 support tickets / 25 technical tasks + related qualification data updates
  - No major features added
- Ada language backend with AdaCore
  - Specification and implementation of a new elementary tool and code generation chain
  - Sideresult: refinement of the tool requirements of TCPrinter
  - Sideresult: unused context argument elimination in the C-chain (potential)
- Other developments (IB Krates)
  - Extended testing framework being developed
  - Some technical tasks carried out on own account

Support for Gene-Auto users

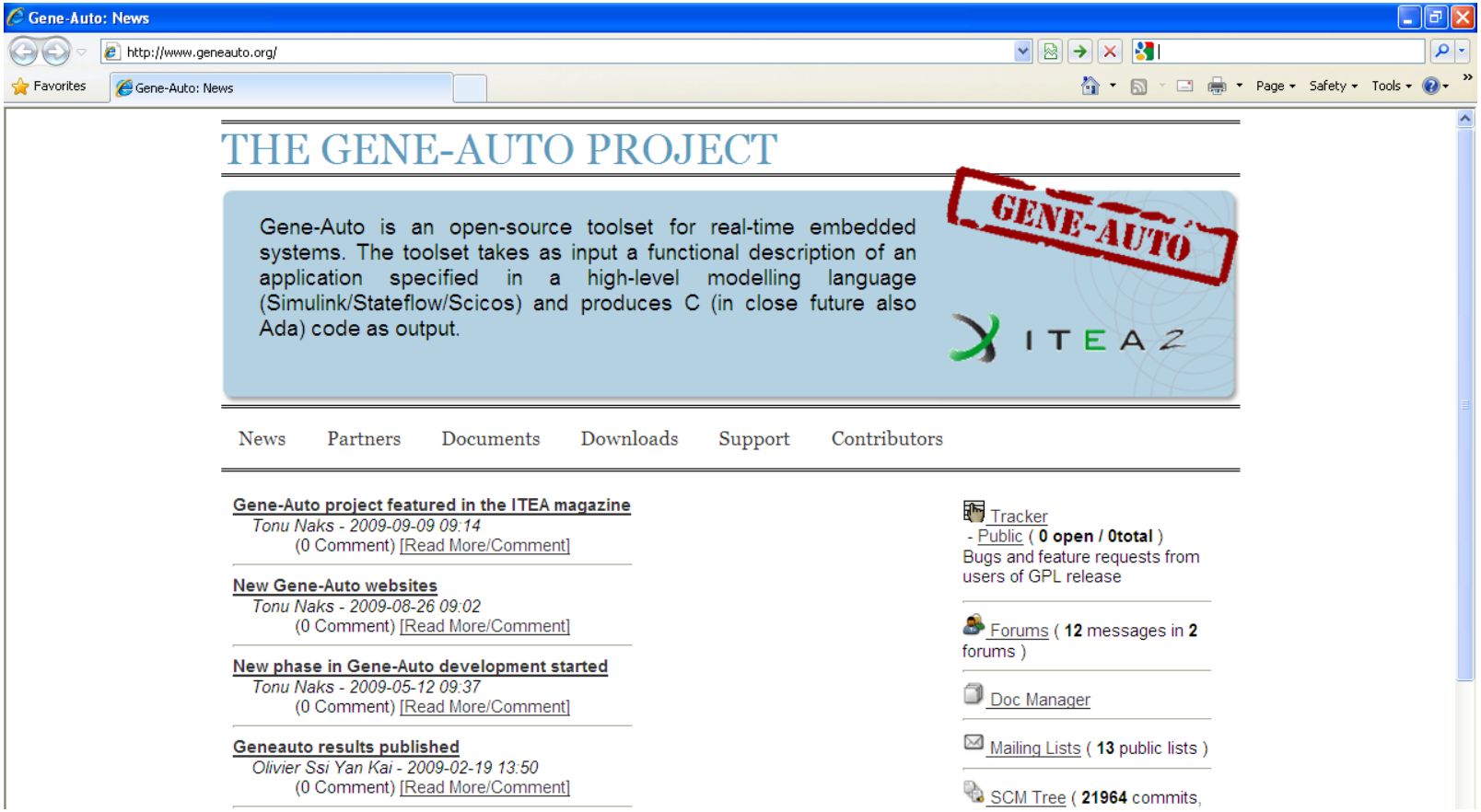
Support for the community (services and actors)

- Public version of Gene-Auto
  - Since the beginning of 2009 with Gene-Auto v2.4.2
  - GPL licensed
  - Freely downloadable in source and binary forms
  - Maintained by IB Krates, Alyotech and FeRIA
- New features and bug-fixes
  - Funding by former consortium members (Airbus, Astrium, FeRIA, IB Krates)
  - Development from new projects (AdaCore, IB Krates)
- Integration of external contributions
- Public releases 2-3 times per year

Support for the community (channels)

- Support provided through the GForge website
  - Public forums
  - Public mailing list
  - Public tracker
  - Public documentation (published papers, user requirements, toolset requirements, user manuals, tool qualification plan user template, public case studies …)
  - Public releases
- www.geneauto.org
  - Frontend to the GForge collaborative site – highlights essential information and guides to detailed information either in GForge or Gene-Auto Pro site

www.geneauto.org



Commercial support

- Dedicated development and support contracts
  - IB Krates, Alyotech
- Gene-Auto Pro
  - geneauto.krates.ee, IB Krates
  - Flat-fee based maintenance scheme
  - Access to the latest developments (development snapshots and releases)
  - Knowledgebase, FAQ, detailed user manuals
  - E-mail and phone support
  - Task database (Customised front-end for gPM) (not yet available)
  - Vote on CCB (Change Control Board)
  - Testing framework and extra tools (not yet available)

Gene-Auto PRO

Gene-Auto PRO subscription levels

- Gene-auto Pro registered user (free)
  - Access to knowledgebase (public)
  - Access to error reporting module (read only)
- Subscriber silver
  - Access to knowledgebase (pro+public)
  - Access to latest releases and development snapshots
  - Access to documentation
  - Access to error reporting module (read-write)
- Subscriber gold
  - Vote on CCB
  - Unlimited e-mail support
- Subscriber platinum
  - Dedicated budget
  - Phone support

Change Control Board (CCB)

- All changes are coordinated by the CCB
- CCB is a virtual body composed of
  - End users with active maintenance contract
  - Gene-Auto PRO subscribers
  - Representatives of developers
- CCB meetings
  - Determine the priorities of toolset development
  - Approve, postpone or reject proposed changes

Future

- Ada backend
  - Estimated beta version by the end of 2009
- Potential additions
  - SysML importer, Simulink exporter,
  - Support for a subset of the Matlab language
  - Verification tools
  - Optimisation, target adaptation
- Supporting infrastructure
- Qualification data preparation
- Increasing the robustness of the tool
- Growing the user base

Thank you!

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