

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 - Withdrawn from user requirements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) truth tables – 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



The screenshot shows a web browser window titled "Gene-Auto: News" with the URL "http://www.geneauto.org/". The main content area features a large heading "THE GENE-AUTO PROJECT" in blue. Below it, a light blue box contains the text: "Gene-Auto is an open-source toolset for real-time embedded systems. The toolset takes as input a functional description of an application specified in a high-level modelling language (Simulink/Stateflow/Scicos) and produces C (in close future also Ada) code as output." To the right of this text is a red stamp that says "GENE-AUTO" and the logo for "ITEA 2". Below the main content is a navigation menu with links for "News", "Partners", "Documents", "Downloads", "Support", and "Contributors". The page is divided into two columns. The left column contains four news items, each with a title, author, date, and comment count, followed by a "Read More/Comment" link. The right column contains four utility links: "Tracker" (Public: 0 open / 0 total), "Forums" (12 messages in 2 forums), "Doc Manager", and "Mailing Lists" (13 public lists). At the bottom of the right column is a link to "SCM Tree" (21964 commits).

THE GENE-AUTO PROJECT

Gene-Auto is an open-source toolset for real-time embedded systems. The toolset takes as input a functional description of an application specified in a high-level modelling language (Simulink/Stateflow/Scicos) and produces C (in close future also Ada) code as output.

GENE-AUTO
ITEA 2

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Gene-Auto project featured in the ITEA magazine
Tonu Naks - 2009-09-09 09:14
(0 Comment) [[Read More/Comment](#)]

New Gene-Auto websites
Tonu Naks - 2009-08-26 09:02
(0 Comment) [[Read More/Comment](#)]

New phase in Gene-Auto development started
Tonu Naks - 2009-05-12 09:37
(0 Comment) [[Read More/Comment](#)]

Geneauto results published
Olivier Ssi Yan Kai - 2009-02-19 13:50
(0 Comment) [[Read More/Comment](#)]

[Tracker](#)
- Public (**0 open / 0 total**)
Bugs and feature requests from users of GPL release

[Forums](#) (**12 messages in 2 forums**)

[Doc Manager](#)

[Mailing Lists](#) (**13 public lists**)

[SCM Tree](#) (**21964 commits**,)



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

How do I change the way code is generated from a supported block? | Gene-Auto PRO

http://geneauto.krates.ee/?q=node/51

File Edit View Favorites Tools Help

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- My account
- Create content
- Recent posts
- Administer
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Book navigation

- FAQ
 - General
 - Toolset functionality
 - Relations to other tools
 - Toolset architecture
 - Intermediate languages
 - Licensing
 - Extensibility
 - What types of extension mechanisms does Gene-Auto provide?

Home » FAQ » Extensibility

How do I change the way code is generated from a supported block?

view edit outline track

Submitted by **Tõnu Näks** on Fri, 14/08/2009 - 12:23

Knowledgebase (Public)

Changing the block implementation can be done exactly the same way as defining new blocks (see **How do I add support for new blocks?**). You implement the backend and typer pair or a pre-compiled library function corresponding to the block's semantics and provide a custom block-library configuration file when launching the tool.

When loading block type descriptions the toolset always first processes the standard library and after that the custom library. If a block is defined both in the standard library and in the custom library, then the definition from the custom library takes precedence.

< **How do I add support for new blocks?** up **Is there any support for composing and processing Gene-Auto models and data types in custom tools?** >

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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)

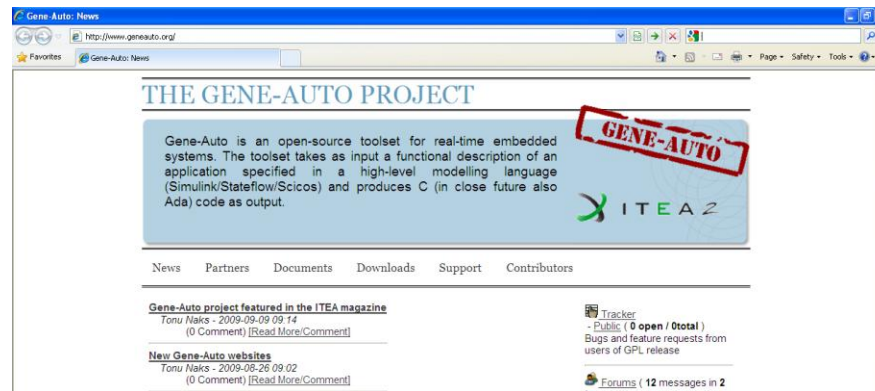
- All changes are coordinated by the CCB
- CCB is a virtual body composed of
 - End users with active maintenance contract
 - Gene-Auto PRO subscribers
 - Representatives of developers
- CCB meetings
 - Determine the priorities of toolset development
 - Approve, postpone or reject proposed changes



- 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!



www.geneauto.org



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