

WGL Meets TGTP

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ThEdu'17, 6 August 2017, Gothenburg, Sweden (at CADE 26)

Web Geometry Laboratory (WGL)

The collage illustrates the integration of the Web Geometry Laboratory (WGL) with the TGTP system. It shows the following components and interactions:

- Teacher's Applet:** Shows a geometric construction on a coordinate plane with a circle and several points labeled A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z.
- Student's Applet:** Shows a similar geometric construction on a coordinate plane.
- Groups:** A list of student groups (Group1, Group2, Group3, Group4, Group5, Group6, Group7, Group8, Group9, Group10) and a list of individual students (Student1, Student2, Student3, Student4, Student5, Student6, Student7, Student8, Student9, Student10).
- Users (Students) — Groups to Students Relation:** A diagram showing the relationship between Groups and Students.
- Buttons to Select a Different Applet:** Buttons for "Play Buttons", "Buttons to the interactive whiteboard", and "More buttons".
- Play Buttons:** Buttons for "Play", "Stop", "Reset", and "More buttons".
- Transfer Buttons:** Buttons for "From Student to Group", "From Group to Student", and "From Student to Student".
- Group's Applet:** A screenshot of the Teacher's applet showing a geometric construction.
- Student's Chat Window:** A window for the Teacher's Chat Input Window.
- Students' and Teacher's Messages:** A window for the Teacher's Chat Input Window.
- Students' and Teacher's Messages (Chat):** A window for the Teacher's Chat Input Window.
- Collaborative Work Session Selection:** A window for the Teacher's Chat Input Window.
- Group selection:** A window for the Teacher's Chat Input Window.
- Students' and Teacher's Messages (Chat):** A window for the Teacher's Chat Input Window.
- Teacher's List of Constructions/Problems:** A window for the Teacher's Chat Input Window.
- Erase an Unlock buttons:** A window for the Teacher's Chat Input Window.
- Student's Save/Erase Buttons:** A window for the Teacher's Chat Input Window.
- Lock Owner Information:** A window for the Teacher's Chat Input Window.
- Teacher's Chat Input Window:** A window for the Teacher's Chat Input Window.
- GeoGebra's applet:** A screenshot of the Student's applet showing a geometric construction.

<http://hilbert.mat.uc.pt/WebGeometryLab/>

Thousands of Geometric problems for geometric Theorem Provers (TGTP)

TGTP - Thousands of Geometric problems for geometric Theorem Provers						
Documents/Help		Problems List		Workbench		Downloads
Problems List		N. rows	10	Page 1 of 24 235 Problems	Home Pg Up Pg Dn End	Logout
reset to default values		235 Problems		Queries: text and Geometric	<input type="text"/> by Name <input type="button" value="Search"/> <input type="button" value="Geometric Search"/>	
Add a new Problem						
Id	Name	Short Description	N. Proofs/N. Attempts			
GEO0281	Adam's Circle	Assume the incircle of triangle ABC touches the sides BC, AC and AB in points D, E and F respectively. The lines AD, BE and CF meet at the Gergonne point G of the triangle DEF is known as Gergonne triangle (and also contact triangle) of triangle ABC. Suppose three lines are drawn through G parallel to the sides of the Gergonne triangle. These meet the sides of triangle ABC in six points P, Q, R, S, T and U. Show that six points are concyclic. Moreover, the circle they lie on is centered at the incenter.	0/3	See details	Update	
GEO0227	Brahmagupta's Theorem	In a cyclic quadrilateral having perpendicular diagonals, the perpendicular to a side from the point of intersection of the diagonals always bisects the opposite side.	1/3	See details	Update	
GEO0268	Butterfly theorem	P1, P2, P3 and P4 are four points on circle k with a center O. M is the intersection of P1P3 and P2P4. Through M draw a line l perpendicular to OM, meeting P2P3 at X and P1P4 at Y. Show that MX congruent with MY.	1/3	See details	Update	
GEO0013	Centroid Theorem		2/2	See details	Update	
GEO0001	Ceva's Theorem		2/2	See details	Update	
GEO0369	Chou 1994 Example 1	In triangle ABC, let F the midpoint of the side BC, D and E the feet of the altitudes on AB and AC, respectively. FG is perpendicular to DE at G. Show that G is the midpoint of DE.	1/1	See details	Update	
GEO0328	Chou 1994 Example 10 (Miquel Point Theorem)	(Miquel Point Theorem) Four lines form four triangles. Show that the circumcircles of the four triangles passes through a common point.	0/1	See details	Update	
GEO0374	Chou 1994 Example 100	ABC is an equilateral triangle. Produce AB to D such that $BD = 2AB$. F is the foot of the perpendicular line from D to BC. Show that AC is perpendicular to AF.	0/1	See details	Update	
GEO0375	Chou 1994 Example 101	The two tangents to the circumcircle of ABC at A and C meet at E. The mediator of BC meet AB at D. Show that A, O, E and D are cyclic.	0/1	See details	Update	
GEO0372	Chou 1994 Example 11 (Nice Point Circle Theorem)	(Nine Point Circle Theorem) Let the midpoints of the sides AB, BC and CA of triangle ABC be L, M and N and AD the altitude on BC. Show that L, M, N, and D are on the same circle.	1/1	See details	Update	

TGTP support the testing and evaluation of geometric automated theorem proving systems.



WGL Meets TGTP

? Should they be put to work together ?

? How can the two systems be put to work together ?

WGL Meets TGTP

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- ▶ The *WGL* user will have an immediate access to a database of geometric conjectures and its automatic proof attempts
(Formal proofs in a Learning Environment)
- ▶ The *TGTP* system would benefit from a wider users base

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? How can the two systems be put to work together ? **Tasks to make it possible:**

- ▶ search mechanisms
- ▶ taxonomy of geometric problems
- ▶ common formats for geometric information interchange

Should They be Put to Work Together ? — Yes !

- ▶ The *WGL* → *TGTP*

A large set of geometric constructions with the possibility of browsing the constructions, exploring conjectures and proofs about those constructions.

- ▶ The *TGTP* → *WGL*

Enlarge the users base of *TGTP*: teachers, and eventually students, could submit new conjectures.

High-school teachers, and students, will contribute problems close to the geometric subjects they are studying.

The interconnection of the two system, *WGL* and *TGTP*, will reinforce each other.

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- ▶ more comprehensive textual search (MySQL Full-Text-Search)

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- ▶ geometric search mechanism

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Like in any other 'shop' adapting the queries to the 'consumer'

Geometric Information Interchange

WGL uses *GeoGebra* as 'in-house' Dynamic Geometry System (DGS), so, the constructions are kept in *GeoGebra*'s format.

TGTP uses the I2GATP common format to store the problems in its database.

The I2GATP format is an extension of the I2G (Intergeo) common format.

The I2GATP library is an open source project to support the I2GATP common format.

filters from(to) DGS/GATP \longleftrightarrow to(from) I2GATP

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Instead of a giant (heavy and difficult to use and maintain!?) tool, trying to cover all, the interconnection of specialised tools seems much more promising.

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- ▶ *Current Status of the I2GATP common format*, Pedro Quaresma, Nuno Baeta, in F. Botana and and Quaresma, Pedro (Eds.), ADG 2014, LNAI 9201, pp. 169-181. Springer, 2015.

Thank You

