# (Euro) Tcl/Tk
# Google Summer of Code
# 2009

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http://tkosiak.blogspot.com

http://www.dacsystem.pl

Euro Tcl 2009 Conference

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# What is GSoC?

- GSoC = Google Summer of Code
- Google pays for **students** to contribute to open source projects
- $5000 per student (=slot)
  $4500 to student, $500 to mentor
- in 2008 all Tcl mentors donated their money to the Tcl Association

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# How it works?

- Mentoring organizations apply to Google GSoC
- Google selects approved organizations (open-source projects).
- Students submit project proposals to particular mentoring organizations
- Mentoring organizations rank student proposals and match students with mentors.
- Google allocates a particular number of student slots (scholarships) to each organization.
- Students work with mentors to complete their proposed projects.
- Students get paid at start, positive mid-term and final evaluation 500, 2000, 2000 USD accordingly.

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# Tcl/Tk @ GSoC

- In 2007 - 3rd edition – last minute effort = Tcl not selected by Google application by Tomasz Kosiak, but supported by Jeff Hobbs

- in 2008 - 4th edition – Tcl/Tk approved for first time with 4+5 slots (lobbying) application by Matthew Burke, support Tomasz Kosiak, Jeff Hobbs + mentors
175 organizations, 1125 students (1100 planned), 83% completed ,
26 apps, few ineligible, 15 students

- In 2009 - 5th edition – Tcl/Tk approved again with 7+2 slots (lobbing) application by Matther Burke, administration Tomasz Kosiak, Jeff Hobbs + mentors
150 organizations, 1000 students (1000 planned)
almost 40 apps, few ineligible, 20+ students

- number of slots is proportional to eligible students applications received

- umbrella organizations, previous year results ➔ adds extra slots

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# Tcl as umbrela in GSoC

- Tcl Community Association as umbrella organization for:
  1) Tcl (core language and other extension like famous Expect)
  2) Tk (GUI Toolkit bundled also with Python, Perl, Ruby, Lua and others)
  3) AOLserver/Naviserver (high performance web server build on top of Tcl)
  4) OpenACS/dotLRN (Tcl web application framework & e-learning system)
  5) aMSN (very popular open source better MSN messenger clone in Tcl)
  6) Jacl (mature Tcl alternative implementation in Java, like Jython)
  7) XOTcl (the most advanced object oriented Tcl extension)
- in 2009 preliminary 7 slots +2 slots finally , in 2008 - 4+5 slots

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# Who is involved?

- MENTORS:
- Andreas Kupries (Tcllib)
- Alaoui Youness (aMSN,TkImg)
- Steve Huntley (GIS)
- Clif Flynt (TkPrint)
- Gustaf Neumann (OpenACS)
- Jeff Hobbs (Regexp)
- Kevin Kenny (TDBC)
- Pat Thoyts (HTTP, Tile)
- Tom Poindexter (Jacl)
- Daniel A. Steffen (TclDTrace)
- Steve Landers (Graphs)

- BACKUP:
- Donal K. Fellows (TCT)
- Gerald W. Lester (TclAppSrv)
- Dossy Shiobara (AOLserver)
- Colin McCormack (TclAppSrv)
- Vlad Seryakov (Naviserver)
- Damon Courtney (InstallJammer)
- ADMINS:
- Matthew M. Burke (application)
- Tomasz Kosiak (organization)

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# GSoC 2009 Timeline (1)

- **February 8: Program announced.**
- March 9: Mentoring organizations can begin submitting applications
- **March 13: Mentoring organization application deadline.**
- March 13-17: Google program administrators review organization applications.
- **March 18: List of accepted mentoring organizations published on the GSoC website**
- **March 18-23: Would-be student participants discuss application ideas with mentoring organizations.**
- **March 23-April 3: Students submit applications to mentoring orgs**
- April 3 - April 15: Mentoring organizations review and rank student proposals
- April 20: Accepted student proposals announced on the GSoC website

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# GSoC 2009 Timeline (2)

- April 20-May 23 Community Bonding Period
- May 23: Students begin coding for their GSoC projects;
- July 6-13: Mentors and students can begin submitting mid-term evaluations
- August 10: Suggested 'pencils down' date
- August 17: Firm 'pencils down' date. Mentors, students and organization administrators can begin submitting final evaluations to Google
- August 25: Final results of GSoC 2009 announced
- October: Mentor Summit at Google in CA, USA

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# Tcl/Tk & Google Summer of Code 2009
## Join at http://www.tcl.tk/gsoc

- Google Summer of Code (**aka GSoC**) – Google pay **$4500** each qualified student for coding for **12 weeks** for approved open source project and **Tcl/Tk** (Tcl Community Assoc.) **is again approved** in **2009**.

- **Tcl/Tk** (http://www.tcl.tk**)** – dynamic (scripting) language officially known as Tool Command Language & GUI Toolkit (Tk) but unofficially as "The C Library" due to its high quality C source code implementation.

- **Tcl/Tk** is **easy** to learn, **very productive** and **widely used** language. Used in GCC/GDB, SQLite and Cisco, Intel, Mentor, IBM, Motorola …

- **Tcl/Tk** in **GSoC 2008** received money from Google for 9 students (vs 10 for PHP) and **all 9 students** successfully completed their projects and **get paid** (low-hype Tcl/Tk = far less competition among students).

- **Tcl Community** is known to be **extremely friendly** although our **project ideas** are **ambitious**.

- **Tcl/Tk GSoC 2009** is about **coding in C and/or Tcl** - **prior** Tcl/Tk knowledge **is not a requirement** but a plus.

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# Tcl/Tk GSoC 2008 (1)

- Loading shared libraries from memory and/or Tcl channels
  Daniel Hans, mentor Andreas Kupries

- Tcl FUSE (Filesystem in User Space) Language Binding
  Alexandros Stergiakis, mentor Stephen Huntley

- TclDTrace
  Remigiusz Modrzejewski, mentor Daniel A Steffen

- Audio input and output library and extension
  Mohamed Abderraouf Bencheraiet, mentor Youness El Alaoui

- Tcl/Tk Printing Support
  Blicharski Krzysztof, mentor Clif Flynt

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# Tcl/Tk GSoC 2008 (2)

- Update Tk test system project
  Ania Pawelczyk, mentor Jeffrey Hobbs

- Graph Manipulations
  Alejandro Eduardo Cruz Paz, mentor Steve Landers

-  AOLserver-GD integration
  Matthew Gagen, mentor Matthew Burke

- A Business Rule Management  System based on XOTcl
  Franz Wirl, mentor Gustaf Neumann

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# Tcl/Tk GSoC 2009 (1)

- SCORM Compliant Content Packaging for Wiki-based Content Development
  Michael Aram, mentor Gustaf Neumann (OpenACS)

- TDBC Driver Development (Core/TDBC)
  Sławomir Cygan, mentor by Kevin Kenny

- Regexp engine cleanup (Core)
  Daniel Kloeck, mentor Jeff Hobbs

- Tcl/Tk Printing Support (Tk/Core)
  Krzysztof Blicharski , mentor Clif Flynt

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# Tcl/Tk GSoC 2009 (2)

- Improve GIS support in Tcl (GIS/Core/Tk)
  Alexandros Stergiakis, mentor Steve Huntley

- Image Handling Enhancement (Core/Tk)
  Łukasz Miądowicz, mentor Youness Alaoui

- Jacl modernization (Jacl)
  Radoslaw Szulgo, mentor Tom Poindexter

- Graph Manipulations (Tcllib)
  Michał Antoniewski, mentor Andreas Kupries

- HTTP/1.1 client, native look for Tk widgets (Chameleon)
  Paraskevi Nikolaidou, mentor Pat Thoyts (aMSN/Tk)

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# Tcl GSoC 2008 Impressions

- Communication is a key but it doesn't always work out of the box

- We need reasonable projects with committed mentors

- What can we expect from a student? C programming, some motivation and no more !!!

- What are student expectations (except Google hype)? Doable project and mentor devotion first, money second

- Shall we bother at all with Tcl 2009 GSoC?

- IMHO GSoC is important way to bring in new Tcl developers (commercial Tcl usage at Tcl based companies is another one)

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# GSoC organization problems

- How to reach students?
  - Reach faculty stuff & students
  - Dr. D. Richard Hipp lecture at Gdańsk & Wroclaw in Poland
- Working with newcommers?
  - define/refine the „real" goals
  - get to know the codebase & maintainers
  - communicate virtually, diferent timezones

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# GSoC 2009 Results

- open question?

- expecations:
  - some usefull code produced (probably not production ready quality)
  - new people join the comunity
  - Tcl visibility, marketing
  - define/discuss what solutions are needed?

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# GSoC 2009 Projects

# Regexp engine cleanup

- Student: Daniel Kloeck

- Mentor: Jeff Hobbs

- The Regexp engine of the tcl language
  should be improved in following ways:
  * Improve performance and/or memory usage.
  * Implement regexp reversion.
  * Fixed character width is assumed, this should be changed.
  * Rewrite the code to use tcl's coding style.
  * Implement stream interface.
  * Implement lookbehind constraints.

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# Tcl/Tk Printing Support Student

- Student: Krzysztof Blicharski

- Mentor: Clif Flynt

- to continue my work

  - add better font support for Tktopdf

  -  improve the text widget Tktopdf PDF export function

  - add Tile widget support to Tktopdf PDF export functions.

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# Improve GIS support in Tcl

- Student: Alexandros Stergiakis
- Mentor: steve huntley
- to produce the necessary language extensions to facilitate programming of GIS systems in Tcl. In particular:
  - Reading files in popular GIS formats
  - Presenting GIS data visually
  - Helper procedures to zoom in/out, etc.

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# Compliant Content Packaging for Wiki-based Content Development

- Michael Aram

- Mentor: Gustaf Neumann

- OpenACS/dotLRN module

- The main part of this project is an implementation of the import and export mechanisms for SCORM content packages, as well as the development of a SCORM compliant run-time environment and authoring platform based on XOWiki.

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# TDBC Driver Development

- Student: Sławomir Cygan

- Mentor: Kevin Kenny

- TDBC drivers
  - Pure-tcl PostgreSQL (pgtclng, pgintcl)
  - C-based PostgreSQL
  - Emulate/use other multidatabase interface
    - Nstcl/Nsdb (OpenACS)
    - Nsdbi (Naviserver)

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# Graph Manipulations

- Student: Michał Antoniewski

- Mentor: Andreas Kupries

- is to extend Tcllib with wide set of functions/algorithms to make TCL well-equipped with Graph Operations and to become attractive language from another point of view

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# HTTP/1.1 support and Chameleon, native look for Tk widgets

- Student: Paraskevi Nikolaidou (she is aMSN developer)
- Mentor: Pat Thoyts + Youness Alaoui
- The first part of this project deals with HTTP/1.1 support in Tcl:
  - Chunking: needs compatibility with the -channel and -handler options
  - Support for pipelined requests in keepalive connections
  - Support for SOCKS and authenticating HTTP proxies with SSL connections
  - Support for SSPI authentication
- The second part is about the Chameleon plugin, which gives native or pixmapped look to Tk widgets:
  - Tcl/tk 8.5 and 8.6 compatibility
  - Adaptation to use snit

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# Image Handling Enhancement

- Student: Łukasz Miądowicz
-  Mentor: Youness Alaoui + Jeff Hobs
- Tk Photo Image Manipulation and Tk Image Handling. I treat this project as one. I would like to implement support for PNG,MNG formats and also JPEG 2000. Other things that I think would be useful are image rotation, floating point scaling, tinting, fourier transforms and other graphical routines that I mention i my application (gaussian bluring, compering pictures using image descriptors,edge detection)

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# Jacl

- Student: Radosław Szulgo
- Mentor: Tom Poindexter
- Bring to Jacal 8.4/8.5 features

# Tcl/Tk GSoC compared

- Dynamic languages

- Python

- PHP

- Others (GNU, Linux, BSD)

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# Dynamic (Scripting) Languages

- R Foundation for Statistical Computing  4
- haskell.org     5
- Ruby on Rails   4
- Tcl Community Association      9
- Perl Foundation 10
- PHP     7
- Mono Project    9
- Python Software Foundation     30

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# Python umbrella

- Python:
  - Python Software Foundation 30
  - Plone Foundation 7
  - Melange 4
  - Mercurial (a member of the Software Freedom Conservancy) 4
  - MoinMoin Wiki 3
  - Django Software Foundation 6

# PHP umbrela in GSoC 209

- PHP
  - PHP    7
  -  Drupal  18
  - Joomla! 15
  - WordPress       11
- Tcl
  - Tcl Community Association      9
  - MacPorts Project       2

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# Other GSoC orgs (slots)

- Git Development Community 2
- Linux Foundation 10
- Debian 11
- Fedora Project & JBoss.org (Red Hat) 9
- openSUSE Project 9
- 
- GNOME 25
- KDE 38
- 
- Eclipse Foundation 20
- Go OpenOffice 5
- Mozilla Project 10
- MySQL 15

- Apache Software Foundation 38
- XWiki 6
- 
- LLVM Compiler Infrastructure 5
- GCC 7
- GNU Project 8
- GNU Image Manipulation Program 6
- 
- FreeBSD Project 20
- NetBSD Project 11
- OpenSSH 1
- Nmap Security Scanner 6

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# Tcl/Tk GSoC 2008 Report

# Tcl/Tk Printing Support (TkPrint)

**Student:** Krzysztof (Krzysiek) Blicharski <blicharski@gmail.com>

**Mentor:** Clif Flynt

**Url:** http://www.assembla.com/wiki/show/tktopdf

- pure Tcl implementation / C source studies
- introspects widgets graphical properties and gathers it nn dicts
- generates PDF from information in those dicts
- handles many widgets including canvas but not text widget
- information how widgets draws itself is duplicated in tktopdf tcl source code – derived from studies on C implementations
- does it support Tile? (probably not)
- the right way is to 1) provide more retrospection about how widgets draws itselves  2) start with a TIP what is really needed

# Loading shared libraries from memory (and/or Tcl channels) (1)

**Student:** Daniel Hans dah4ns@gmail.com

**Mentor:** Andreas Kupries

**Url:** http://trac.assembla.com/gsoc2008-tcl_dynamic_libraries/wiki

**Goal:** enable loading shared libraries from starkits without putting them in temporary files

**Explored solution**

- porting RTLD library (part of FreeBSD dynamic linker) to Linux and trying to make it work with Linux dynamic linker

- why RTLD – its license is compatible with Tcl so it could be bundled

**Results**

- RTLD was extracted from FreeBSD sources and ported to Linux

- It can load simple dynamic shared libraries

- It cannot load libtcl85.so from memory (fix could be simple or quite complex – no diagnosis)

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# Loading shared libraries from memory (and/or Tcl channels) (2)

**Problems**

- It required high degree expertise on shared libraries linker internals – not already available within Tcl community so student mosty worked on his own – when he got stuck we couldn't really help him without doing work for him (and it wasn't exercised)
- AKU: On OS X we have OS support, making it basically 100% an integration thing – complexity 99% in Tcl, 1% in linker
- AKU: On other platform complexity was not in the integration, but in the load/link parts themselves, maybe 1% integration, 99% linker internals

**Perspectives**

- Do not create/bundle own linker (based on RTLD) but help to put memory-load feature into native linkers on supported platforms
- Use some workarounds to use native linkers (put shared library in /dev/shm on BSD, FUSE on Linux, Windows ???)

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# Update Tk Test System (TkTests) (1)

**Student:** Ania Pawelczyk <[ania.pawelczyk@gmail.com](mailto:ania.pawelczyk@gmail.com)>

**Mentor:** Jeff Hobbs

**Url:** [http://www.assembla.com/wiki/show/TkTests](http://www.assembla.com/wiki/show/TkTests)

## Goals

1. convert syntax from tcltest v1 to tcltest v2

2. re-examination of why many of tests fail

3. independence from the system's settings – revisiting constraints

4. individual test case independence – adding setup/cleanup

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# Update Tk Test System (TkTests) (2)

## Results

- Goal 1 is formally accomplished

- Goals 2..4 just scratched – see
  http://www.assembla.com/flows/flow/a_KwcurkGr3ztnab7jnrAJ

- 65 out 110 test files is lastly touched by aniap
  http://tktoolkit.cvs.sourceforge.net/viewvc/tktoolkit/tk/tests/?sortby=author#dirlist

- person new to Tl/Tk cannot become tktest expert without extensive help from mentors

- maybe 50% of effort was spoiled

- no Tile tests touched – project was not called TtkTests (intended?)

# Tcl Bindings to DTrace (TclDTrace)

**Student:** Remigiusz (Jan Andrzej) Modrzejewski <lrem@go2.pl> Poland,Gdańsk

**Mentor:** Daniel Steffen (Switzerland, Zurich)

**Url:** http://dev.lrem.net/tcldtrace/

- **DTtace** - dynamic tracing framework from Sun

- The most successful project from Polish students (both mentor and student are very happy with it)

- Student had all the required skills – what was indeed needed?
a) C programming, b) good system administration skill which allowed him to create work environment OpenSolaris, c) kernel understanding (he writes for Linux Journal about Linux kernel)

- Mentor was very helpful – helped to design API, tested on unavailable platform (Mac OS X),

- Undisturbed systematic communication – almost the same time zone (Poland – Switzerland)

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# Tcl GSoC 2008 Motivation

- I hire graduates from Technical University of Gdańsk after they prove themselvs in internship during summer

- GSoC provided funding and mentorship to work on projects which didn't benefit DAC System directly

- organizing work is my daily job – I'm quite good at making things happen

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# Tomasz Kosiak's Background (tkosiak)

- Working with Tcl from 1999 (first AOLserver, now mosty Tcl servers)

- Owner, manager, software architect/developer at DAC System - DAC System is 3 years old company, 8-10 people, writing dedicated software (in Tcl and AJAX) for telemetry and doing the deployments

- Living in Gdańsk Bay area in northern Poland (TriCity=Trójmiasto) – there are also other Tcl users: zjednoczenie.com (AOLserver based websites ex. mtv.eu), Polska.pl/Poland.pl (national portal), Intel Technology Poland (testing)

- Tcl in South Poland (Krakow) : Wojciech Kocjan (http://www.kocjan.org/about-me.html), ANT Industrial Software Systems (general SCADA/HMI with Tk and/or AJAX UI), www.onet.pl (AOLserver)

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# Q & A

## Contact

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