

# Report on Tcl/Tk Google Summer of Code 2009

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16th Annual Tcl Conference  
Sep 30 – Oct 2 2009, Portland, OR



# Tomasz Kosiak's Background (tkosiak)

- Working with Tcl from 1999 (first AOLserver, now mostly Tcl servers)
- Owner, manager, software architect/developer at DAC System - DAC System is almost 5 years old company, it used to be 8-10 people (but now is 5-6), 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>) and Googie (SQLite Studio), ANT Industrial Software Systems (general SCADA/HMI with Tk and/or AJAX UI), [www.onet.pl](http://www.onet.pl) (AOLserver)

# My Tcl/Tk GSoC Motivation

- I have used to hire graduates from Technical University of Gdańsk after they prove themselves during internship in my company
- GSoC provided funding and mentorship to work on projects which don't benefit DAC System directly
- organizing work is my daily job – I'm quite good at making things happen
- I have contact with talented students ... and I can direct them to take a look at Tcl/Tk

# 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

# 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.

# 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 (lobbying) 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

# Tcl as umbrella 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

# 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)**



# 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

# 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

# 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.



# 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

# 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

# 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

# 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)

# My Tcl GSoC 2008/2009 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)



# GSoC organization problems

- How to reach students?
  - Reach faculty staff & students
  - Dr. D. Richard Hipp lecture at Gdańsk & Wrocław in Poland
- Working with newcomers?
  - define/refine the „real” goals
  - get to know the codebase & maintainers
  - communicate virtually, different timezones

# GSoC 2009 Results

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

# GSoC 2009 Triggers Questions!

- How to attract new developers to Tcl/Tk?
  - Certainly some effort is needed to publicise Tcl/Tk strengths
- Is Tcl/Tk still viable platform for new development?
  - **current** technical strong points behind Tcl/Tk
  - what is the future for Tcl/Tk?
  - business perspective for new Tcl/Tk developments
- What are carieer opportunities for new developers getting involved with Tcl/Tk?

# Tomasz Kosiak's Influence

- I provide guidelines to Tcl based businesses in Gdansk Bay area  
(DAC System / Zjednoczenie.com / Polska.pl)
- I am involved as an IT architect and I can push Tcl/Tk at least into the following projects:
  - environment monitoring projects in Poland
  - major rewrite of an equipment tracking system for Polish mining industry (150 000 miners in Poland)
  - biometric systems for Polish Border Control (gov. prj.)
- I must find out what are Tcl/Tk future prospects

# Tomasz Kosiak's Influence

- I may act as an consultant for Technical University of Gdańsk about integrating open-source trends into CS students curriculum
  - there is/was a plan to get EU funds to create open-source lab which will help students interact win open-source projects worldwide
  - there is a need or possibility to influence Polish students by notable individuals from open-source by organizing some lectures in Poland
  - eg. D. Richard Hipp talks at Gdansk and Wrocalw Tech Universities this year in March 2009

# So I need a BOF/WIP session on Tcl/Tk Future Prospects

I have some notes to facilitate the  
discussion --tkosiak



# 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.

# 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.

# 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.

# 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.

# 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)

# 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

# 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 pixmapmed look to Tk widgets:
  - Tcl/tk 8.5 and 8.6 compatibility
  - Adaptation to use snit

# 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 in my application (gaussian blurring, compering pictures using image descriptors, edge detection)



# 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)

# 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

# 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 umbrella in GSoC 2009

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

# 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

# Tcl/Tk GSoC 2008 Report

# Tcl/Tk Printing Support (TkPrint)

**Student:** Krzysztof (Krzysiek) Blicharski <[blicharski@gmail.com](mailto: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 in 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 itselfes 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](mailto:dah4ns@gmail.com)

**Mentor:** Andreas Kupries

**Url:** [http://trac.assembla.com/gsoc2008-tcl\\_dynamic\\_libraries/wiki](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)

# 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 mostly 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 ???)

# 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>

## 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

# 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](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 TI/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](mailto:lrem@go2.pl)> Poland, Gdańsk

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

**Url:** <http://dev.lrem.net/tclidtrace/>

- **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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# Q & A

## Contact

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