European Community Seventh Framework Programme
Theme FP7-ICT-2011-7
Computing Systems

Online Automatic Tuning (AutoTune)

D1.1
Project Handbook
Houssam Haitof

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PROJECT INFORMATION

Project acronym: AutoTune
Project full title: Automatic Online Tuning
Grant agreement no: 288038
Call (part) identifier: FP7-ICT-2011-7
Funding scheme: Collaborative project

DOCUMENT INFORMATION

Deliverable Number: D1.1
Deliverable Name: Project Handbook
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Keywords: Project Structure and Procedures, Information Communication
WP/Task: WP1 / Task 1.1

DISSEMINATION LEVEL

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ABSTRACT

This document is intended to serve as a Project Handbook for all members of the AutoTune consortium. It summarizes the project structure and the relevant reporting and communication procedures. To better fulfill its function as a quick reference, this document may be updated during the evolution of project. The intention of this document is to point to project relevant structural and procedural information and to provide references to related documents in the case where more details are desired.
# TABLE OF CONTENTS

1 AUTOTUNE AT A GLANCE ................................................................. 9
2 PROJECT STRUCTURE .................................................................. 10
   2.1 Partners ........................................................................ 10
   2.2 Roles of Partners .......................................................... 10
   2.3 Contact Points ................................................................. 11
   2.4 Management and Governance Structure .......................... 12
   2.5 Work Packages .................................................................. 13
      WP1: Management ............................................................. 13
      WP2: Online Tuning Framework ......................................... 13
      WP3: Online Performance Analysis .................................. 14
      WP4: Online Tuning Plugins ............................................. 14
      WP5: Applications and Evaluation .................................... 14
      WP6: Exploitation and Dissemination ............................... 15
   2.6 Effort distribution by task .................................................. 15
3 PROJECT PROCEDURES AND ACTIVITIES .............................. 17
   3.1 Documents templates and reviewing procedures .............. 17
   3.2 Meetings ........................................................................ 17
   3.3 Means of communication and sharing ............................... 18
      • Mailing lists .................................................................. 18
      • Internal web space ....................................................... 18
      • Mind-mapping tool ...................................................... 18
      • Video Conferences ..................................................... 19
   3.4 Paragraphs to include in reports and publications ............... 19
   3.5 Financial statements ....................................................... 19
   3.6 Eligible costs of the project ............................................... 19
   3.7 Reporting periods and language of reports ......................... 21
   3.8 Reports and deliverables ................................................... 21
   3.9 Payment modalities .......................................................... 22
   3.10 Financial audits and controls ............................................. 22
   3.11 Technical audits and reviews ............................................ 23
   3.12 Information and communication ...................................... 23
   3.13 Gender parity ................................................................. 24
   3.14 Risk management ............................................................ 24
   3.15 Exploitation and dissemination activities ......................... 25
      Further dissemination activities ......................................... 27
      Dissemination-related excerpts from Annex II of GA ................ 27
   3.16 Intellectual property rights (IPR) ....................................... 28
   3.17 Suspension of the project .................................................. 29
4 CHRONOLOGICALLY ORDERED LIST OF DELIVERABLES .......... 30
5 LIST OF MILESTONES ............................................................... 33
6 PROJECT TIME TABLE ............................................................... 34
7 REFERENCES TO RELEVANT DOCUMENTS ............................... 36
1 AUTOTUNE AT A GLANCE

Contract Number
288038

Full Name
Automatic Online Tuning

Type of Project
Collaborative Project, STREP

Project Participants
1) TECHNISCHE UNIVERSITAET MUENCHEN (TUM), Germany
2) UNIVERSITAET WIEN (UNIVIE), Austria
3) CAPS entreprise (CAPS entreprise), France
4) UNIVERSITAT AUTONOMA DE BARCELONA (UAB), Spain
5) BAYERISCHE AKADEMIE DER WISSENSCHAFTEN (BADW-LRZ), Germany
6) NATIONAL UNIVERSITY OF IRELAND, GALWAY (NUI Galway), Ireland

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E <gerndt@in.tum.de>

Project Website
www.autotune-project.eu

Budget
Total cost [€]: 3,233,832.00
EC funding [€]: 2,348,980.00

Time
Starting date: October 15th, 2011
Duration: 36 months
2 PROJECT STRUCTURE

This section describes the project partners, associated partners, contact points, management structure, work-packages, and financial resources.

2.1 Partners

The challenging goals of the AutoTune consortium require a broad range of competences in order to be achieved. Therefore selection of partners complementing each other with diverse experience backgrounds and at the same time sharing a common vision of the solution is crucial for the overall success of the project. AutoTune team consists of the world class research centers (TUM, UNIVIE, UAB), national supercomputing centers (BADW-LRZ, NUI GALWAY) and leading HPC industry companies (CAPS, IBM).

2.2 Roles of Partners

TUM is the main developer of Periscope. It will provide its extensive knowledge on performance analysis and tuning for scientific parallel applications as well as its deep knowledge on the design and implementation of Periscope. It will also bring in its extensive collaboration with other European and American groups on performance analysis tools within the Vi-HPS as well as beyond this virtual institute.

UNIVIE will lead the overall design of the performance tuning framework (WP2). It will provide its extensive experience on HPC language, compiler and tool development to the project. UNIVIE will also contribute to the development of tuning support for hybrid HPC architectures based on GPU accelerators. In this context, UNIVIE will bring to the project its experience and know-how gained in the EU project PEPPHER which focuses on programmability and performance portability of single-node, heterogeneous many-core systems.

CAPS will bring its expertise in parallel high level code generation and optimization for heterogeneous multi-cores.

UAB will bring its experience in dynamic analysis and tuning of parallel applications. In particular, it will provide its knowledge about MPI applications, parallel programming patterns and dynamic instrumentation and tuning. UAB is the main developer of MATE (Monitoring, Analysis and Tuning Environment), and hence it will provide the familiarity in developing this kind of tools.

BADW-LRZ will bring its expertise in monitoring and tuning applications. BADW-LRZ will also operate the high-end supercomputer which acts as one testbed for the tools. Finally, BADW-LRZ will provide applications from its user’s base.

NUI GALWAY will focus on testing the AutoTune application and analyzing the results with respect to the cost of optimization. The pragmatic nature of the real world test cases will help ensure the software will be suitable for commercial production use.
2.3 Contact Points

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85748 Garching, Germany.
2.4 Management and Governance Structure

Considering the size and complexity of AutoTune project, the management of the project will be conducted at multiple levels (see Figure 1). The Project/Scientific Coordinator will ensure that project deadlines are met, proper procedures are carried out, and progress against objectives of the project is reviewed. The administrative management of the project will be carried out by an Administrative Coordinator who will be supported by experts from TUM financial administration. The Management Board, which consists of the project coordinator, the workpackage leaders and a representative of those partners that are no workpackage leaders, will govern the project. The overall scientific and technical management of the project, which consists in ensuring that the technical goals of the project are reached, will be done in collaboration with the scientific coordinator, and in turn with the WP leaders. WP leaders will be responsible for the progress of the individual WPs, the timely production and quality of deliverables and the achievement of milestones; the latter in close collaboration with the scientific coordinator.

![Management structure](image)

**Figure 1: Management structure**

Management board is composed of:

- TUM: Michael Gerndt, Houssam Haitof
- CAPS: Francois Bodin
- UNIVIE: Siegfried Benkner
- UAB: Anna Sikora
- BADW-LRZ: Matthias Brehm
- NUI GALWAY: Gilles Civario
2.5 Work Packages

WP1: Management

Involved partners: TUM, UNIVIE, CAPS, UAB, BADW-LRZ, NUI GALWAY

Objectives:

- To ensure delivery of the scientific and technical results within the time and budget constraints.
- To establish clear and effective communication between partners; to detect management and technical issues as early as possible and bring them to resolution.
- To establish and enforce the requisite management and quality procedures that will result in high quality project deliverables.
- To provide efficient operational management support including: administrative and financial planning and reporting to the European Commission, management of project legal aspects including project-related contracts and IPR tracking and management of day-to-day operational and technical progress.

Deliverables:

- D1.1 (PM3): Project Handbook
- D1.2-D1.4 (PM12, PM24, PM36). Periodic progress report
- D1.5-D1.7 (PM12, PM24, PM36): Periodic management report
- D1.8 (PM36): Final project report
- D1.9 (PM36): Report on horizontal issues

WP2: Online Tuning Framework

Involved partners: TUM, UNIVIE, CAPS, UAB, BADW-LRZ, NUI GALWAY

Objectives:

- To develop a model of the tuning process
- To design the overall tuning framework.
- Definition of interfaces for the tuning plugins
- Continuous integration of software components into a fully functional framework

Deliverables:

- D2.1 (PM6) Report on tuning model and PTF design
- D2.2 (PM12) PTF Demonstrator
- D2.3 (PM24) PTF Integrated Prototype
- D2.4 (PM32) PTF Release
WP3: Online Performance Analysis

Involved partners: TUM UNIVIE CAPS UAB BADW-LRZ NUI GALWAY

Objectives:

- Extend Periscope’s monitoring infrastructure
- Extend Periscope’s static program representation
- Performance analysis for OpenCL and HMPP
- Energy efficiency analysis
- Advanced MPI communication analysis

Deliverables:

- D3.1 (PM12): Report on extended monitoring system
- D3.2 (PM24): Report on application properties related to GPGPU performance and energy efficiency
- D3.3 (PM32): Report on fully extended analysis

WP4: Online Tuning Plugins

Involved partners: TUM UNIVIE CAPS UAB BADW-LRZ NUI GALWAY

Objectives:

Implement the following tuning plugins

- GPU tuning plugin
- Energy efficiency tuning plugin
- MPI tuning plugin
- CPU compiler options exploration plugin

Deliverables:

- D4.1 (PM12): Report on the design of the tuning plugins
- D4.2 (PM24): Report on the prototype tuning plugins
- D4.3 (PM32): Report on the release of the tuning plugins

WP5: Applications and Evaluation

Involved partners: TUM UNIVIE CAPS UAB BADW-LRZ NUI GALWAY

Objectives:

- Set up an application repository
- Analysis of application bottlenecks and manual tuning
- Evaluation of tuning components
- Analysis of common I/O bottlenecks for further AutoTune developments
- Best practice user guide and documentation

**Deliverables:**

- D5.1 (PM12) Report on the selected applications including the achieved improvements by manual tuning and the tuning effort.
- D5.2 (PM12) Application repository
- D5.3 (PM24) Report of the test results of the integrated prototype
- D5.4 (PM24) Report of the analysis on I/O bottleneck for further implementation phases
- D5.5 (PM36) Result of test on the PTF Release and the documentation.

**WP6: Exploitation and Dissemination**

**Involved partners:** TUM  UNIVIE  CAPS  UAB  BADW-LRZ  NUI GALWAY

**Objectives:**

- To ensure dissemination of the results to relevant scientific and industrial forums.
- To maintain a web-site to serve as a repository of project outcome.
- To keep a general audience informed about the project.
- To guide and demonstrate take-up of the results by industrial and academic partners.

**Deliverables:**

- D6.1 (PM3): AutoTune web-site with initial project presentation slides, outline and motivation of the project, and initial contributions (will be updated continuously).
- D6.2 (PM12): Report on dissemination results.
- D6.4 (PM30): Post-project exploitation plan.
- D6.5 (PM36): Report on exploitation and dissemination results.

**2.6 Effort distribution by task**
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Table 1: Effort distribution by task
3 PROJECT PROCEDURES AND ACTIVITIES

3.1 Documents templates and reviewing procedures

All the documents and reports have to use the template published in the AutoTune internal CMS (www.autotune-project.eu) under the section documents->templates. The reviewing process for a report is done using the following steps:

1. A first reviewer (or group of reviewers) shall be identified at least 5 weeks before the report submission deadline. The reviewer(s) should be from a different institution than the report author (unless this is unfeasible) and shall have expertise in the domain related to the report. It is up to the management board to identify the reviewer(s).
2. A first draft of the document shall be submitted to the reviewer(s) at least 4 weeks before the deadline.
3. The reviewer(s) shall provide written comments to the document author(s) within 1 week of their reception of the document.
4. After 1 week of the reception of the comments, the author(s) shall provide a second draft taking into consideration the comments from the first review to a second reviewer (or group of reviewers) from the management board.
5. The second reviewer(s) shall provide written comments to the document author(s) within 1 week of their reception of the document.
6. The report authors have 1 final week before the document deadline to provide a final version of the document that includes the reviewers comments.

3.2 Meetings

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<td>Focused technical meetings</td>
<td>UAB</td>
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<td>Plenary demonstrator integration meeting: Collaborative evaluation of demonstrator - All partners</td>
<td>CAPS</td>
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<td>PM14</td>
<td>First review meeting in Brussels</td>
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<td>PM13-20</td>
<td>Focused technical meetings</td>
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### Means of communication and sharing

#### Mailing lists

There are four mailing lists to be used depending on the type of communication:

- **autotune_management@lists.lrz.de**: for management related issues.
- **autotune_developers@lists.lrz.de**: for development related issues, support and bug reports.
- **autotune_members@lists.lrz.de**: the general list containing all the AutoTune contributors.
- **autotune_partners@lists.lrz.de**: used to communicate with the AutoTune partners not officially part of the project.

#### Internal web space

A password-protected content management system based on Drupal can be accessed at www.autotune-project.com. This space can be used to store/share documents and to access information about the procedures, access to clusters, repositories and so on.

#### Mind-mapping tool

A mind-mapping tool (MindJet) is used to keep track of the to-do’s, meeting notes, and progress reports among the partners.

The shared space with several mindmaps is organized in two areas:

- **AutoTune Static**: This area stores maps with stable contents. These maps are edited by the coordinator (TUM).
  - **Organization**: This map provides information about the goals, deliverables, milestones, documents like the technical annex, fact sheet, and meeting protocols.
- **AutoTune**: This area stores maps with dynamic contents. These maps are edited by all partners.
- Video Conferences

For our video conferencing needs, we rely on the conference service of DFN. The service uses Adobe Connect as the video conferencing tool. The service can be accessed by pointing the browser to: https://webconf.vc.dfn.de/autotune/.

3.4 Paragraphs to include in reports and publications

All publications should contain the following statement to indicate that the publication was generated with the assistance of financial support from the EU:

The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 288038 (AutoTune Project, www.autotune-project.eu).”

Prior to any publication, the express approval of the AutoTune Management Board is necessary, and a disclaimer that may be expressed as follows has to be present:

“The opinions of the authors expressed in this document do not necessarily reflect the official opinion of the European Commission.”

3.5 Financial statements

Each beneficiary (that is project partner) will be required to submit financial statements (cost claims) during the project implementation. The format of the financial statements, which form the basis for any payments made by the Commission, is illustrated in Section “Form C - Financial Statement”. The frequency of providing financial statements is related to the project reporting periods defined in the Grant Agreement.

3.6 Eligible costs of the project

The following excerpts from the document “FP7 Grant Agreement - Annex II – General Conditions” [4] describe eligible and non-eligible costs of the project.
“Costs incurred for the implementation of the project shall meet the following conditions in order to be considered eligible:

a) they must be actual;

b) they must be incurred by the beneficiary;

c) they must be incurred during the duration of the project, with the exception of

d) costs incurred in relation to final reports and reports corresponding to the last period as well as certificates on the financial statements when requested at the last period and final reviews if applicable, which may be incurred during the period of up to 60 days after the end of the project or the date of termination whichever is earlier;

e) they must be determined in accordance with the usual accounting and management principles and practices of the beneficiary. The accounting procedures used in the recording of costs and receipts shall respect the accounting rules of the State in which the beneficiary is established. The beneficiary’s internal accounting and auditing procedures must permit direct reconciliation of the costs and receipts declared in respect of the project with the corresponding financial statements and supporting documents;

f) they must be used for the sole purpose of achieving the objectives of the project and its expected results, in a manner consistent with the principles of economy, efficiency and effectiveness;

g) they must be recorded in the accounts of the beneficiary; in the case of any contribution from third parties, they must be recorded in the accounts of the third parties;

h) they must be indicated in the estimated overall budget in Annex I.”

“The following costs shall be considered as non-eligible and may not be charged to the project:

a) identifiable indirect taxes including value added tax,

b) duties,

c) interest owed,

d) provisions for possible future losses or charges,

e) exchange losses, cost related to return on capital,

f) costs declared or incurred, or reimbursed in respect of another project of [the Union],

g) debt and debt service charges, excessive or reckless expenditure.”
3.7 Reporting periods and language of reports

AutoTune project includes the following reporting periods,

I. P1: from month 1 to month 12
II. P2: from month 13 to month 24
III. Final: from month 25 to the last month of the project

All reports and deliverables shall be in English.

Excerpts from Annex II [4] of GA,

“At the end of each reporting period, the Commission shall evaluate project reports and deliverables required by the provisions of Annex I and disburse the corresponding payments within 105 days of their receipt unless the time-limit, the payment or the project has been suspended.”

3.8 Reports and deliverables

Before the submission, AutoTune deliverables are internally reviewed by two members of the consortium. To ensure neutral judgment, preferably internal reviewers should not be involved in the development of the deliverable.

Excerpts from Annex II [4] of GA,

“The consortium shall submit a periodic report to the Commission for each reporting period within 60 days after the end of each respective period. The report shall comprise:

a) an overview, including a publishable summary, of the progress of work towards the objectives of the project, including achievements and attainment of any milestones and deliverables identified in Annex I. This report should include the differences between work expected to be carried out in accordance with Annex I and that actually carried out,

b) an explanation of the use of the resources, and

c) a financial statement, from each beneficiary together with a summary financial report consolidating the claimed contribution of [the Union] of all the beneficiaries in an aggregate form, based on the information provided in Form C (Annex VI) by each beneficiary.”

“The consortium shall submit a final report to the Commission within 60 days after the end of the project. The report shall comprise:

a) a final publishable summary report covering results, conclusions and socioeconomic impact of the project.
b) a report covering the wider societal implications of the project, including gender equality actions, ethical issues, efforts to involve other actors and spread awareness as well as the plan for the use and dissemination of foreground.”

“The coordinator shall submit a report on the distribution of the financial contribution of [the Union] between beneficiaries. This report must be submitted 30 days after receipt of the final payment.”

“A certificate on the financial statements shall be submitted for claims of interim payments and final payments when the amount of the financial contribution of [the Union] claimed by a beneficiary under the form of reimbursement of costs is equal to or superior to EUR375000, when cumulated with all previous payments for which a certificate on the financial statements has not been submitted.”

“The consortium shall transmit the reports and other deliverables through the coordinator to the Commission by electronic means. In addition, Form C, must be signed by the authorized person(s) within the beneficiary’s organisation, and the certificates on the financial statements and on the methodology must be signed by an authorised person of the auditing entity, and the originals shall be sent to the Commission.”

“Payments shall be made after the Commission’s approval of reports and/or deliverables. The absence of a response from the Commission within this time-limit shall not imply its approval.”

### 3.9 Payment modalities

Annex II [4] of GA specifies the following,

“The Commission shall make the following payments:

a) a pre-financing in accordance with Article 6,

b) for projects with more than one reporting period, the Commission shall make interim payments of the financial contribution of [the Union] corresponding to the amount accepted for each reporting period.

c) the Commission shall make a final payment of the financial contribution of [the Union] corresponding.”

“Payments by the Commission shall be made in Euro.”

“Costs shall be reported in Euro”

### 3.10 Financial audits and controls

Excerpts from Annex II [4] of GA,
“The Commission may, at any time during the implementation of the project and up to five years after the end of the project, arrange for financial audits to be carried out, by external auditors, or by the Commission services themselves including OLAF. The audit procedure shall be deemed to be initiated on the date of receipt of the relevant letter sent by the Commission. Such audits may cover financial, systemic and other aspects (such as accounting and management principles) relating to the proper execution of the grant agreement. They shall be carried out on a confidential basis.”

“In addition, the Commission may carry out on-the-spot checks and inspections in accordance with Council Regulation (Euratom, EC) No 2185/96 of 11 November 1996 concerning on the-spot checks and inspections carried out by the Commission in order to protect the European Communities’ financial interests against fraud and other irregularities and Regulation (EC) No 1073/1999 of the European Parliament and of the Council of 25 May 1999 concerning investigations conducted by the European Anti-Fraud Office (OLAF) Council Regulation (Euratom) No 1074/1999 of 25 May 1999 concerning investigations conducted by the European Anti-Fraud Office (OLAF).”

3.11 Technical audits and reviews

Excerpts from Annex II [4] of GA,

“The Commission may initiate a technical audit or review at any time during the implementation of the project and up to five years after the end of the project. The aim of a technical audit or review shall be to assess the work carried out under the project over a certain period, inter alia by evaluating the project reports and deliverables relevant to the period in question. Such audits and reviews may cover scientific, technological and other aspects relating to the proper execution of the project and the grant agreement.”

“The Commission may be assisted in technical audits and reviews by external scientific or technological experts. Prior to the carrying out of the evaluation task, the Commission shall communicate to the beneficiaries the identity of the appointed experts. The beneficiary(ies) shall have the right to refuse the participation of a particular external scientific or technological expert on grounds of commercial confidentiality.”

3.12 Information and communication

Annex II [4] of GA specifies the mode of communication between the Commission and the Consortium as follows,

“beneficiaries are represented towards the Commission by the coordinator, who shall be the intermediary for any communication between the Commission and any beneficiary, with the exceptions foreseen in this grant agreement.”

The following is an excerpt of rules for communication and information defined in the “FP7 Grant Agreement - Annex II – General Conditions” [4],

23
“The beneficiaries shall, throughout the duration of the project, take appropriate measures to engage with the public and the media about the project and to highlight the financial support of [the Union]. Unless the Commission requests otherwise, any publicity, including at a conference or seminar or any type of information or promotional material (brochure, leaflet, poster, presentation etc), must specify that the project has received research funding from [the Union] and display the European emblem. When displayed in association with a logo, the European emblem should be given appropriate prominence. This obligation to use the European emblem in respect of projects to which [the Union] contributes implies no right of exclusive use. It is subject to general third-party use restrictions which do not permit the appropriation of the emblem, or of any similar trademark or logo, whether by registration or by any other means. Under these conditions, beneficiaries are exempted from the obligation to obtain prior permission from the Commission to use the emblem. Further detailed information on the EU emblem can be found on the Europa web page.

Any publicity made by the beneficiaries in respect of the project, in whatever form and on or by whatever medium, must specify that it reflects only the author’s views and that the [the Union] is not liable for any use that may be made of the information contained therein.”

In any case, the express approval of the AutoTune Management Board is necessary, and the disclaimer may be expressed as follows:

“The opinions of the authors expressed in this document do not necessarily reflect the official opinion of the European Commission.”

3.13 Gender parity

Gender parity is not satisfactory in research activities in the ICT sector, where most of the graduates come from disciplines (such as engineering) that are still predominantly male. The European Commission and dedicated gender equality institutions have defined a common framework to promote parity, and AutoTune will support the existing parity strategies established by expert committees in Europe. In particular, AutoTune is committed to encouraging and supporting the participation of women in research and in ensuring that research activities reflect and address the needs of women as well as men.

3.14 Risk management

By the quality of the consortium, the careful work plan, and the management structure, these risks can all be considered rather low, signs of problems will be detected early, and steps can be taken to avoid technical delays or side-tracking of the project. On the other hand, the consequences of these risks could be severe for the outcome of AutoTune, and all possible steps should be undertaken to make sure that they do not happen. The basic premise of the project is to openly communicate within the consortium and be honest about problems that need to be solved. Work package leaders have the responsibility of overseeing the technical progress and interfacing with their related work packages, and be aware of technical problems that can affect the project. This awareness will be shared with the scientific/project coordinator so that the right steps can be taken to keep the project on track. What follows is a list of the technical risks that AutoTune is sensible to:
Lack of integration

An integrated prototype showing the planned aspects and advantages of PTF cannot be constructed. This could be caused by lack of communication, and will be countered by communication (emails, telephone conferences, meetings), and by the activities of the scientific coordinator. In particular, a Task 2.3, is dedicated to the integration and has substantial effort. The annual meetings of the whole consortium will pay attention to emerging problems of this kind.

Tuning techniques do not give the expected benefits

The tuning actions of a tuning plugin do not show appropriate results. This can be caused by trying applications that are already tuned in that respect or limitations in the approach or the execution environment. During the first year, for each tuning plugin appropriate applications will be identified and the possible tuning result be demonstrated by manual tuning. Thus, early in the project appropriate actions can be taken.

Parts do not fit

Software parts of different work packages do not fit, and an integrated prototype cannot be constructed. This could be caused by a bad specification and lack of communication, and will be countered by a thorough kick-off meeting, and the commitment to an early specification of software interfaces between the work packages. The necessary specifications will be updated timely and continually. The overall integration of the interfaces will be demonstrated in the PTF demonstrator (Milestone M2).

Key parts of WP not ready

Technical difficulties (or lack of man-power) can of course cause delayed output from a workpackage. The WP leader and the scientific coordinator should be alert for signs of this happening, so that problems of the above-mentioned nature do not happen. If parts cannot be ready on time, reformulation of sub-goals or other emergency measures can be taken. It may likewise be possible to delegate some work to other partners. Permanent understaffing (risk: failure to hire) is a problem that need to be dealt with (prevented) from the start of the project.

System support for energy measurements on SuperMUC will not be delivered

The associate partner IBM promised the implementation of an API to perform detailed energy measurements on the new HPC system at BADW-LRZ. If this cannot be delivered the project will investigate coarser alternatives based on general Linux system support.

3.15 Exploitation and dissemination activities

The timeliness and novelty of AutoTune means that all aspects of the research work will lead to innovation-related results. Thus there is a need to optimize co-ordination between partners in order to effectively take advantage of opportunities for dissemination and optimization. To this end, AutoTune will adopt a dissemination and exploitation strategy for both scientific and industrial directions. This strategy will need to take account of the various methodological and technical outcomes of the project and their potential and actual impact. One of our dissemination challenges is therefore to develop a range of dissemination methods with templates, guidelines, resources and frameworks that can be used flexibly by all partners in a range of situations to maximize impact.
The consortium will mostly pursue an open approach, with dissemination via a website, publications, teaching, and workshops. The industrial partner will also focus on commercial dissemination. The plan is that the various routes to dissemination will ultimately come together with the publication of a book and “best practices” guide, at the end of the project. We now discuss each route to dissemination in more detail.

**Website.** AutoTune will install a project website, which will be maintained throughout the project. The website will be updated frequently to keep the interested community aware of the progress of the project. All public reports, including papers and presentation slides will be made available. Project internal material (below a certain sensitivity level) will be maintained on a password protected part of the website.

**Conference publications.** The consortium will aim to rapidly disseminate novel results via high-quality international conferences, such as the following:

- Euro-Par Conference (Springer LNCS)
- HiPEAC: International Conference on High-Performance Embedded Architectures and Compilers
- (Springer LNCS)
- IPDPS: International Parallel and Distributed Processing Symposium (IEEE)
- ICPP: International Conference on Parallel Processing
- PLDI: International Conference on Programming Language Design and Implementation (ACM)
- PACT: International Conference on Parallel Architectures and Compilation Techniques (ACM/IEEE)
- PPoPP: Symposium of Principles and Practice of Parallel Processing (ACM)
- SPAA: Symposium on Parallelism in Algorithms and Architectures (ACM)
- Computing Frontiers Conference (ACM)

**Journal publications.** Towards the end of the project, the consortium will write mature journal articles for high-quality international journals, such as the following:

- ACM Transactions on Programming Languages and Systems
- ACM Transactions on Architecture and Code Optimization
- Concurrency and Computation: Practice and Experience
- HiPEAC Journal
- IEEE Micro
- IEEE Transactions on Parallel and Distributed System
- International Journal of Parallel Programming
- Journal of Parallel and Distributed Computing
- Parallel Computing
- Parallel Processing Letters
- International Journal of Parallel Programming

The consortium will focus on technical coordination to ensure a high quality of published output.
**Teaching.** The academic partners will use results in teaching where appropriate, particularly as a basis for Masters and Doctoral thesis projects. The project will produce advanced results in many areas that will have a natural place in advanced courses and seminars on modern parallel processing.

**Workshops and tutorials.** AutoTune will integrate PTF into the half year tuning workshop of the Vi-HPS that are given at major HPC centers in Germany and other European countries. The project will organize tutorials at leading parallel computing conferences to inform worldwide experts on this development.

**Further dissemination activities**

**Promotion & advertising**

- Publication via Ercim News
- HPCWire white paper publication (‘advertorial’)
- Press releases via a press agency
- Youtube video (e.g. http://www.youtube.com/movidiacorp)

**Events**

- CeBIT (http://www.cebit.de/homepage_e)
- Supercomputing (SC) (http://www.sc-conference.org/)

**Dissemination-related excerpts from Annex II of GA**

“Each beneficiary shall ensure that the foreground of which it has ownership is disseminated as swiftly as possible. If it fails to do so, the Commission may disseminate that foreground.”

“Dissemination activities shall be compatible with the protection of intellectual property rights, confidentiality obligations and the legitimate interests of the owner(s) of the foreground.”

“At least 45 days prior notice of any dissemination activity shall be given to the other beneficiaries concerned, including sufficient information concerning the planned dissemination activity and the data envisaged to be disseminated.”

“Following notification, any of those beneficiaries may object within 30 days of the notification to the envisaged dissemination activity if it considers that its legitimate interests in relation to its foreground or background could suffer disproportionately great harm. In such cases, the dissemination activity may not take place unless appropriate steps are taken to safeguard these legitimate interests.”

“All publications or any other dissemination relating to foreground shall include the following statement to indicate that said foreground was generated with the assistance of financial support from [the Union]:

**The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 288038 (AutoTune Project, www.autotune-project.eu).**”
“Any dissemination activity shall be reported in the plan for the use and dissemination of foreground, including sufficient details/references to enable the Commission to trace the activity. **With regard to scientific publications relating to foreground published before or after the final report, such details/references and an abstract of the publication must be provided to the Commission at the latest two months following publication.** Furthermore, an electronic copy of the published version or the final manuscript accepted for publication shall also be provided to the Commission at the same time for the purpose set out in Article II.12.2 if this does not infringe any rights of third parties.”

### 3.16 Intellectual property rights (IPR)

No specific management of knowledge and Intellectual Property Right (IPR) issues arise in the AutoTune project, except those that are considered to be common in Computer Science and will not harm our dissemination and exploitation efforts.

Related excerpts from Annex II [4] of GA,

“Foreground shall be the property of the beneficiary carrying out the work generating that foreground.”

“Where several beneficiaries have jointly carried out work generating foreground and where their respective share of the work cannot be ascertained, they shall have joint ownership of such foreground. They shall establish an agreement regarding the allocation and terms of exercising that joint ownership.”

“However, where no joint ownership agreement has yet been concluded, each of the joint owners shall be entitled to grant non-exclusive licences to third parties, without any right to sub-licence, subject to the following conditions:

a) **at least 45 days prior** notice must be given to the other joint owner(s); and

b) fair and reasonable compensation must be provided to the other joint owner(s).”

“Where a beneficiary transfers ownership of foreground, it shall pass on its obligations regarding that foreground to the assignee including the obligation to pass those obligations on to any subsequent assignee.”

“Where a beneficiary intends to transfer ownership of foreground to a third party established in a third country not associated to the Seventh Framework Programme, the Commission may object to such transfer of ownership of foreground, if it considers that this is not in accordance with the interests of developing the competitiveness of the European economy or is inconsistent with ethical principles or security considerations.”

“Patent applications relating to foreground, filed by or on behalf of a beneficiary must include the following statement to indicate that said foreground was generated with the assistance of financial support from [the Union]:

...
The work leading to this invention has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 288038.”

“The beneficiaries shall use the foreground which they own or ensure that it is used.”

“The beneficiaries shall report on the expected use to be made of foreground in the plan for the use and dissemination of foreground. The information must be sufficiently detailed to permit the Commission to carry out any related audit.”

“Access rights to foreground shall be granted to the other beneficiaries, if it is needed to enable those beneficiaries to carry out their own work under the project. Such access rights shall be granted on a royalty-free basis.”

“Beneficiaries shall enjoy access rights to foreground, if it is needed to use their own foreground. Subject to agreement, such access rights shall be granted either under fair and reasonable conditions or be royalty-free.”

“Beneficiaries may define the background needed for the purposes of the project in a written agreement and, where appropriate, may agree to exclude specific background.”

3.17 Suspension of the project

Related excerpts from Annex II [4] of GA,

“The coordinator shall immediately inform the Commission of any event affecting or delaying the implementation of the project.”

“The coordinator can propose to suspend the whole or part of the project if force majeure or exceptional circumstances render its execution excessively difficult or uneconomic. The coordinator must inform the Commission without delay of such circumstances, including full justification and information related to the event, as well as an estimation of the date when the work on the project will begin again.”

“The Commission may suspend the whole or part of the project where it considers that the consortium is not fulfilling its obligations according to this grant agreement.”

“During the period of suspension, no costs may be charged to the project for carrying out any part of the project that has been suspended.”
## 4 CHRONOLOGICALLY ORDERED LIST OF DELIVERABLES

<table>
<thead>
<tr>
<th>Del. no.</th>
<th>Name</th>
<th>WP no</th>
<th>Nature</th>
<th>Dissemination level</th>
<th>Delivery date (proj. month)</th>
<th>Task</th>
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<tbody>
<tr>
<td>D1.1</td>
<td>Project Handbook</td>
<td>WP1</td>
<td>R</td>
<td>PU</td>
<td>3</td>
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<td>D6.1</td>
<td>AutoTune web site</td>
<td>WP6</td>
<td>O</td>
<td>PU</td>
<td>3</td>
<td>1.1</td>
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<tr>
<td>D2.1</td>
<td>Report on Tuning model and PTF design</td>
<td>WP2</td>
<td>R</td>
<td>PU</td>
<td>6</td>
<td>2.1, 2.2</td>
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<td>Periodic Progress Report</td>
<td>WP1</td>
<td>R</td>
<td>PU</td>
<td>12</td>
<td>1.1, 1.2</td>
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<td>PTF Demonstrator</td>
<td>WP2</td>
<td>P</td>
<td>PP</td>
<td>12</td>
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<td>D3.1</td>
<td>Report on extended monitoring system</td>
<td>WP3</td>
<td>R</td>
<td>PU</td>
<td>12</td>
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<td>R</td>
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<td>12</td>
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<td>Report on the selected application including the achieved improvements by manual tuning and the tuning effort</td>
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<td>R</td>
<td>PU</td>
<td>12</td>
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<td>Application repository</td>
<td>WP5</td>
<td>O</td>
<td>PP</td>
<td>12</td>
<td>5.1</td>
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<tr>
<td>D6.2</td>
<td>Report on dissemination results</td>
<td>WP6</td>
<td>R</td>
<td>PU</td>
<td>12</td>
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<td>WP1</td>
<td>R</td>
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<td>1.1, 1.2</td>
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<td>PP</td>
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<td>R</td>
<td>PU</td>
<td>24</td>
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<td>WP5</td>
<td>R</td>
<td>PU</td>
<td>24</td>
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<td>D6.3</td>
<td>Report on exploitation and dissemination results</td>
<td>WP6</td>
<td>R</td>
<td>PU</td>
<td>24</td>
<td>6.1, 6.2</td>
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<td>WP6</td>
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<td>P</td>
<td>PU</td>
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<td>PU</td>
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<td>WP4</td>
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<td>R</td>
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Table 3: Deliverables
Nature of the deliverable using one of the following codes:
R = Report, P = Prototype, D = Demonstrator, O = Other
Dissemination level using one of the following codes:
PU = Public,
PP = Restricted to other programme participants (including the Commission Services)
RE = Restricted to a group specified by the consortium (including the Commission Services)
CO = Confidential, only for members of the consortium (including the Commission Services)
# 5 LIST OF MILESTONES

<table>
<thead>
<tr>
<th>Milestone no.</th>
<th>Name</th>
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<th>Expected date</th>
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<td>WP1,2</td>
<td>PM6</td>
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<td>WP2,3,4,5</td>
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<td>WP2,3,4,5</td>
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<td>M4: PTF Release 1.0</td>
<td>WP2,3,4,5</td>
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Table 4: Milestones
6 PROJECT TIME TABLE

The three years are broken into three phases: Design and Demonstration (PM1-PM6), Development and Evaluation (PM7-PM32), Documentation and Dissemination (PM33-PM36). The names of the phases indicate only the main focus, i.e., dissemination will be an important task over the entire project lifecycle.

**Phase 1: Design and Demonstration**

All the partners work closely on the definition of the tuning process model (Task 2.1) and the design of PTF (Task 2.2). They also identify application that benefit from the project’s tuning technology and manually optimize those applications (Task 5.1).

**Phase 2: Development and Evaluation**

The groups develop their parts of PTF (Tasks 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, and 4.4) and integrate those parts into early prototypes (Task 2.3). A continuous evaluation based on the application repository will support the development (Task 5.3).

**Phase 3: Documentation and Dissemination**

The final PTF Release finished at the end of the second phase will be documented and evaluated (Task 5.4). It will be made available for download under Open Source for other groups (Task 2.3).
### Figure 2: Workplan

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<th>2018</th>
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<th>2020</th>
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7 REFERENCES TO RELEVANT DOCUMENTS

[4] FP7 Grant Agreement - Annex II General Conditions