



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH



VEL TECH
Dr.RR & Dr.SR
TECHNICAL UNIVERSITY
University u/s 3 of UGC Act, 1956
Avadi, Chennai

**Specific Student Exchange Agreement
between
the UNIVERSITAT POLITÈCNICA DE CATALUNYA, SPAIN
and
VEL TECH RANGARAJAN DR. SAGUNTHALA R&D INSTITUTE OF SCIENCE AND TECHNOLOGY,
India.**

Of the one part, Col. Prof. Dr. R. Rangarajan Holder of Passport Number: G1103080 in his capacity as Founder Chancellor and President of the **VEL TECH RANGARAJAN DR. SAGUNTHALA R&D INSTITUTE OF SCIENCE AND TECHNOLOGY**, referred to hereinafter as **VEL TECH**, registered office in (city) #42 Avadi- VEL TECH Road, Avadi, Chennai; and in representation of the same, in accordance with Article 6.2 & 6.4 at 70/2014 of the University Trust Deed; and of the other part, Prof. Enric Fossas Colet, rector of the **Universitat Politècnica de Catalunya (UPC)**, which is the holder of tax identification number (CIF) Q0818003F, appointed by Decree 257/2013, of 26 November (Official Gazette of the Catalan Government No. 6512, of 29 November 2013), acting in accordance with the powers assigned to him under Article 20 of Organic Law 6/2001, of 21 December, on Universities, and Articles 67 and 68 of the Statutes of the Universitat Politècnica de Catalunya, approved by Decision GOV/43/2012, which approves amendments made to the Statutes of the UPC and provides for the publication of the full text there of (published in the Official Gazette of the Catalan Government No. 6140, of 1 June 2012; correction of data in the Official Gazette of the Catalan Government No. 6257, of 20 November 2012),

hereby agree to the terms and conditions set forth below.

STUDENT EXCHANGE PROGRAMME

A. PURPOSE

The purpose of this programme is to enable and establish a programme of continuing student exchanges between the two universities.

B. DEFINITION OF TERMS

In this agreement, "exchange" means the one-for-one exchange of students (bachelor's and master's degree students from each university participating in the exchange programme). "home institution" means the university from which the participating student intends to graduate, and "Host institution" means the university that has agreed to receive exchange students from the home institution. "Visiting students" are students accepted by the host university who benefit from the academic agreements between the two institutions but not from the financial terms of their relationship. Visiting students must therefore pay the cost of their studies at the host university.

C. BILATERAL AGREEMENTS

In order to carry out the student exchange programme, the schools and faculties of the VEL TECH and the UPC shall sign bilateral agreements that cover the students enrolled in their respective programmes. These bilateral agreements, which shall be attached to this agreement as annexes, shall include the following:

a. Exchange flow: the number of places available and the courses to which the agreement applies.

When there is a balance in the number of exchange students set for the two universities, the financial terms stipulated in sections F and G of this agreement shall apply, regardless of how many students are actually sent by each university. If more students than the balanced number set participate in the exchange programme, the students in excess of this number shall be considered visiting students.

For exchange students enrolled in bachelor's degree courses, the maximum stay at the host university shall be two consecutive semesters. If at the end of this period they wish to extend their stay, they shall be considered visiting students.

For exchange students enrolled in master's degrees comprising 120 credits, the length of the stay at the host university shall be one or two semesters, and in the case of students enrolled in master's degree courses comprising 90 or 60 credits, the maximum stay shall be one semester.

b. Contact details for the coordinators at the schools involved, for the purpose of sending candidate applications and confirmations of acceptance, academic records after exchanges are completed, and any other communication between the parties concerning the exchange of students.

D. SELECTION OF PARTICIPANTS

The home institution shall assess bachelor's and master's degree students enrolled in their institution who wish to participate in the exchange programme. School or faculty coordinators shall send their counterparts at the partner institution the applications of nominated bachelor's and master's degree exchange students, and of visiting students for whom places are available. The host institution reserves the right to make the final decision concerning the admission of each student nominated to participate in an exchange or stay.

E. EXCHANGE GUIDELINES

Guidelines for bachelor's and master's degree exchange students and visiting students:

a) Exchange and visiting students may choose any official academic programme offered by the host institution, with full-time status, without academic effects at the host institution.

Any academic credit earned by the student at the host institution may be transferred to the home institution in accordance with the procedures established by the latter.

b) The host institution reserves the right to exclude exchange students from *numerus clausus* programmes or those with restricted enrolment.

c) Exchange and visiting students must complete at least one year of continuous study at their home institution before the exchange year.

d) Exchange and visiting students must comply with all rules and regulations in effect at the host institution.

e) Exchange and visiting students must certify that they have sufficient personal funds available to cover expenses related to their stay at the host university (mainly food and accommodation).

f) After studying at the host institution for one academic period, all exchange students must return to their home institution. Any extensions to stays must be approved by both universities.

F. RESPONSIBILITIES OF UPC SCHOOLS

Schools that sign bilateral agreements agree to accept exchange students from the VEL TECH and enrol them as full-time students, although this shall in no case lead to them receiving an official degree from the UPC, and to provide them with financial aid to pay enrolment fees, provided that the principle of parity and balance is adhered to with respect to the flow of exchange students between the two universities. At the end of each academic term, the UPC coordinator shall send the VEL TECH coordinator an academic certificate for the exchange or stay of each student who has studied at the UPC. When communicating the acceptance of students, the UPC shall indicate to VEL TECH which students shall be considered exchange students, and which visiting students.

G. RESPONSIBILITIES OF VEL TECH SCHOOLS AND FACULTIES

Schools and faculties that sign bilateral agreements agree to accept exchange students from the UPC and enrol them as full-time students, although this shall in no case lead to them receiving an official degree from the VEL TECH, and to provide them with financial aid to pay enrolment fees, provided that the principle of parity and balance is adhered to with respect to the flow of exchange students between the two universities. At the end of each academic term, the VEL TECH shall send the UPC an academic certificate for the exchange or stay of each student who has studied at the VEL TECH. When communicating the acceptance of students, the VEL TECH shall indicate to the UPC which students shall be considered exchange students, and which visiting students.

H. FUNDING AND SERVICES

Students participating in the exchange programme shall enrol and pay the enrolment fee and any other applicable charges at their home institution before starting the exchange. Visiting students shall enrol and pay the enrolment fee and any other applicable charges at the host university.

All exchange students must have health, accident and third party liability insurance. Each host institution shall supply all of the documents students will need to obtain visas.

Exchange and visiting students shall bear the cost of:

- a) transport to and from the host institution;
- b) medical insurance, health services, and any other costs not expressly mentioned herein;
- c) textbooks and personal expenses;
- d) all debts incurred during the year;
- e) food and accommodation.

Both institutions shall facilitate and support any financial aid applications submitted to national or international bodies that may provide assistance to fund this exchange programme.

I. CONFIDENTIALITY

The parties shall define boundaries with respect to confidentiality in any annexes to this agreement. Furthermore, if the relationship established between the parties leads to the exchange of information between them, VEL TECH agrees to not to disclose and to maintain the confidentiality of any methodological and scientific matters that are identified by the VEL TECH or the UPC as confidential, for the term of this agreement.

J. USE OF CORPORATE IDENTITY

Whenever, as a result of and pursuant to the agreements set forth herein, one of the parties deems it necessary to use the logos of the other institution, it shall request the prior

authorisation of that university through the Communications Service (or equivalent), specifying the corresponding application (whether graphic or electronic, and on any medium) and the type of use for which the request is made.

The authorisation, which in all cases must be provided in writing, shall specify the use or uses covered and the period for which it remains in force, which in no case shall exceed the term of this agreement.

Notwithstanding the foregoing, when the proposed use of logos and other identifying marks is related to an activity from which the institution requesting authorisation expects to earn a profit, a corresponding trademark licensing agreement must be executed.

K. TRANSPARENCY

According to the laws that regulate "Transparency, access to public information and good governance", the UPC will publish information on the signatory parts, including the economic conditions and all modifications that arise in future, related to this Collaboration Agreement.

I. RENEWAL, TERMINATION AND AMENDMENTS

This agreement shall remain in force for a period of four (4) years from the date of the last signature, with the understanding that it may be terminated by either party providing a minimum of 6 months' advance written notice to the other. This agreement may be extended by mutual written agreement of the parties hereto. This agreement may be amended by the exchange of correspondence between the two institutions. Such amendments must be approved by both institutions in a document signed by both parties, which shall be annexed to this memorandum of agreement. When these steps have been taken, such amendments shall form an integral part of this agreement.

In the event of termination of this agreement, the parties shall take such measures as are required to ensure the continuity thereof until the completion of any actions and projects already started.

IN WITNESS WHEREOF, the parties have signed this agreement in two counterparts, both in English, on the date indicated below.

For VEL TECH



Col. Prof. Dr. R. RANGARAJAN
Founder Chancellor & President.

For the UPC



Prof. Dr. ENRIC FOSSAS COLET
Rector.

Date: 27th MAY 2016.

Date: 27/06/16

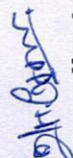


Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. in 3 of UGC Act, 1956)

Universitat Politècnica De Catalunya (UPC), Spain

Name of the Research Institute/University/ Organization	Country	Duration of the Agreement	Academic Year	Date of Signing	Date of Expiry	Purpose/Activities
Universitat Politècnica de Catalunya (UPC)	Spain	4 years	2016-17	27.06.2016	26.06.2020	Student Exchange Program in Post Graduate and Under Graduate Level

Actual Activities with Universitat Politècnica De Catalunya (UPC), Spain	
A.Y. 2017-18	Faculty Mobility (Incoming - Short Courses) - 2
A.Y. 2019-20	Faculty Mobility (Incoming - Short Courses) - 1


MoU Coordinator




Dean - International Relations

Dr. P. Suresh
Dean -International Relations

Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
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School of Computing

Department of Computer Science Engineering

Specialized one credit course on
“Practical Functional Programming with Haskell”
(1157CS914)

by

Prof. Dr. Jordi Petit Silvestre

Universitat Politècnica De Catalunya, Spain



Held on

Date: March 15 to 23, 2018

Jordi Petit

Department of Computer Science
Universitat Politècnica de Catalunya

jpetit@cs.upc.edu

Education

PhD in Computer Science, Universitat Politècnica de Catalunya, 2001.

Cum Laude by Unanimity and European Doctor mentions.

Higher Degree in Informatics Engineering, Universitat Politècnica de Catalunya, 1996.

Diploma in Mathematics and Sciences of Nature, Lycée Français de Barcelona, 1990.

Professional positions

Associate professor, Universitat Politècnica de Catalunya, 2002 to present.

Assistant professor, Universitat Politècnica de Catalunya, 1999-2002.

Freelance web developer for composer Philip Glass, 1999-2002 (sporadically).

Programmer, European Union project ALCOM-IT, 1996-1998.

Teaching fellow, Universitat Politècnica de Catalunya, 1993-1996.

Honors and awards

Extraordinary award to best PhD thesis in IT, Universitat Politècnica de Catalunya, 2001.

Certification of special teaching merits, Universitat Politècnica de Catalunya, 2010.

Positive periodical evaluations of teaching, Agència per a la Qualitat del Sistema Universitari de Catalunya.

Positive periodical evaluations of research, Comisión Nacional Evaluadora de la Actividad Investigadora.

Languages

English, French: Excellent.

Spanish, Catalan: Native.

German: Beginner.

Highlighted projects

Jutge.org, an educational online programming judge featuring static code analysis, formal verification and data-mining.

Design of placement and routing algorithms for the synthesis of VLSI standard cells and their implementation into CAD tools.

Parallel partition for quick-sort and quick-select on multicores, built into experimental GCC.

Cache conscious algorithms for lists, with STL compliant implementation.

ParaDict, a data parallel library for dictionaries on massively parallel and vectorial machines.
Graph algorithms in the WiseBed library for wireless sensor networks.
Heuristic skeletons for the Mallba optimization library for geographically distributed systems.
Design and implementation of the Philip Glass web site.

Highlighted scientific activities

Publications: 19 articles in international peer reviewed journals, 33 articles in peer reviewed conferences, 2 chapters in books. See <http://www.cs.upc.edu/~jpetit/#publications> for full list.

Project participation: 7 projects funded by the EU and 3 projects funded by Spanish agencies.

Community service: Member of 3 PhD committees. Reviewer for major international conferences and journals. Book review of *Algorithms and Data Structures* by K. Mehlhorn and P. Sanders.

Highlighted teaching activities

Advising: Theses advisor for one PhD and three MSc students. End of studies project advisor of 19 students. Mentor for 4 incoming international exchange students.

Graduate courses: Randomized algorithms, Advanced topics in distributed computing, Seminar on algorithms and complexity, Combinatorial optimization.

Undergraduate courses: Fundamentals of informatics, Programming 1, Programming 2, Methodology of programming, Algorithms, Design and analysis of algorithms, Data structures and algorithms, Parallel algorithms, Programming challenges, Programing phones and mobile devices.

Programmes: Bachelor Degree in Data Science and Engineering, Bachelor Degree in Informatics Engineering, Master in Innovation and Research in Informatics, Bachelor's degree in Mathematics, Bachelor's degree in Statistics, Bachelor's degree in Industrial Engineering.

Industrial courses: C++ and Java courses taught at HP and Sony.

Creation of several courses and adaptation of existing ones to the European Higher Education Area.

Organizing member of the **Olimpiada Informática Española** and co-organizer of the **Programming summer camps** at UPC.

Co-coach of the UPC teams for the **ACM-ICPC** contests (10 world finals in 12 years).

Excellent evaluations in official student surveys.

Course Proposal:

Practical Functional Programming with Haskell

Jordi Petit

Computer Science Department
Universitat Politècnica de Catalunya

Introduction

This document presents my proposal to deliver a course at Veltech Dr. RR & Dr. SR University in the context of the MoU signed between Veltech and UPC. This course shall be of interest for the students in Veltech's Computer Science & Engineering undergraduate programmes. There is no need to say that I am open to discuss the topics and methodology of the proposal with the relevant professors at Veltech and the Veltech Academic Council in order to ensure that the course is well adapted to your studies.

Course description

Functional programming is a programming paradigm where software is built by composing pure functions, avoiding shared state, mutable data, and side-effects. Whilst functional programming has only been considered an academic topic in the past, nowadays it is quickly becoming widespread. This is witnessed by the emergence of several functional programming languages such as OCaml, F#, Scala and their adoption in industrial settings.

Haskell is a functional programming language, based on formal mathematical principles. As such, it is easy to reason about and develop, and it executes efficiently on modern machines. Its power and its expressiveness make it an excellent tool to learn functional programming.

By the end of the course, the student be able to:

- Understand the elements of the functional programming and apply them in ordinary programming tasks.
- Develop simple programs involving basic Haskell techniques, including pure functions and the IO monad.
- Understand concepts as higher order functions and lazy evaluation and solve common algorithmic problems using them.
- Model data through algebraic data types and apply recursion to define functions that traverse such types via pattern matching. Generalize types through classes.
- Apply simple formal methods to assert properties of functional programs.

- Get advantage of functional programming concepts when programming with imperative and object oriented programming languages such as Javascript or Python.

It must be noted, though, that the goal of the course is not to show each possible feature of Haskell, but rather, to show the power, elegance and simplicity of functional programming using it.

Teaching methodology

The course will be very practical and hands-on:

- The classes will alternate new concepts introduced by the lecturer and exercises solved by the students in front of the computer.
- The lecturer will interact with the students while they solve their exercises, and will discuss the various alternatives arising in their solution afterwards.

An essential and distinctive feature of this course will be the use of *Judge.org*, the UPC online programming judge: Students will have access to a well organized collection of exercises and will be able to submit their solutions to the judge, which will automatically issue a verdict on their correctness.

Students

This course is geared towards undergraduated students who already know imperative programming. Anyone with basic notions of algorithmics and data structures (say *quicksort* and *binary search trees*) will be able to follow the course.

Syllabus

The following topics will be covered:

1. Introduction to functional programming: History, context, usages.
2. First steps in Haskell: Functions, basic types, lists, lazy evaluation.
3. Higher order functions: maps, folds, filters..., lambdas.
4. Data types: Recursive data types, pattern matching, infinite types.
5. Classes: Definition, derived instances.
6. Monads: do notation, the IO monad.
7. Conclusion.

Evaluation

The evaluation of the course will be on Day 6 and could last for 2 or 3 hours. Several exercises (of the same type and difficulty as the ones worked during the course) will be presented to the students, who will have to solve them using the exam facilities of Judge.org.

Factibility analysis

I have already taught the topics included in this proposal using the proposed methodology as part of a larger course called Programming Languages during the last 6 semesters. Most of the material and exercises are already prepared (just a few exercises should be translated to English). The official pollings that UPC performs among the students of Programming Languages have always been highly positive. The main difference will be the pace of the course: 4 hours per day during one week versus 4 hours per week during seven weeks. To take this intensive tempo into account, I have adapted the contents of the course to this new format without losing the big picture. Consequently, I am confident that the course will be successful.

Bibliography

The following books are recommended to follow this course and get more depth on the presented topics, but will not be necessary for the course:

- R. Bird, *Thinking Functionally With Haskell*. Cambridge University Press, 2015.
- M. Lipovaca, *Learn You a Haskell For Great Good*. No Starch Press, 2011. Available online at learnyouahaskell.com.
- B. O'Sullivan, J. Goerzen and D. Stewart. *Real World Haskell*, O'Reilly Media, 2008.

The following paper we wrote gives an overview of Jutge.org, including its extensions for Haskell exercises:

- J. Petit, S. Roura, J. Carmona, J. Cortadella, A. Duch, O. Giménez, A. Mani, J. Mas, E. Rodríguez-Carbonella, A. Rubio, J. de San Pedro, D. Venkataramani. *Jutge.org: Characteristics and experiences*. IEEE Transactions on Learning Technologies, pp 1–13, 2017. DOI 10.1109/tlt.2017.2723389



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DR283

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received
on 14/2/18
mm

DA/5278
15/2/18

Office of International Programmes

Visiting Professor Programmes

Details of Professor & Course:

Name of the Professor	Prof. Dr. Jordi Petit Silvestre (CV Attached)
University & Country	Universitat Politècnica de Catalunya, Spain
Title of the Course	Practical functional programming with Haskell ✓
Department	Computer Science and Engineering ✓
Dates of the Course	March 15 to 23, 2018 ✓
Total No. of Hours	20
No. of Credits	1
Course Content	Attached

Prepared by: *[Signature]*

Coordinator – Office of Intl. Pgms

Forwarded by: *[Signature]*

Director – Office of Intl. Pgms

[Signature]
HoD

[Signature]
Dean

[Signature]
Director (Academic)

[Signature]
Vice Chancellor

[Signature] 06/02/18
Dr. S. Sivapriya
Director International Relations
Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

24.02.18

066

SNo	Stu_Id	Stu_Name	Stu_Branch	Stu_Test_SubjectCode	Stu_Test_SubjectName	Stu_Subject_PassFail	Stu_Grade
1	VtU7186	KONDREDDYGARI RAKESH KUMAR REDDY	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
2	VtU7851	DEEPIKA KALYANI	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
3	VtU7302	CHAIKAM LOKESH REDDY	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
4	VtU8022	SANGARAJU VIKRAM VARMA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
5	VtU8468	SWATI U SHINDE	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
6	VtU8306	MALAKA MANOJ KUMAR	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
7	VtU7953	PENUMATCHA PREM AJITH VARMA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
8	VtU6980	NALAMOTHU MAHESH	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
9	VtU7226	VEMULA RAGHU VEERA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
10	VtU8294	UDUTHA MAHESH YADAV	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
11	VtU7217	BUKKE HARSHA VARDHAN	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	D
12	VtU7863	TUMULURI ARYAN SURYA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	D
13	VtU7071	CHINNA CHANDRAPPAGARI SUSHMA CHOWDARY	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	D
14	VtU8308	PUDI SAI VENKAT KIRAN	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
15	VtU7089	MAHANKALI SAHITHI	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C

16	VtU7221	SRUSHTY R	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
17	VtU8229	MADDULA SAI TEJA NAVEEN	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
18	VtU7166	KRISHNAM PRASANTH	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
19	VtU6967	VULASA CHAITHANYA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
20	VtU7134	SIDHARTH KUMAR B	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
21	VtU8175	EDARA GREESHMA SAHITHI	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
22	VtU7014	NUNNA DEEPTHI	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
23	VtU8057	KARUPARTHI POOJITHA	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	C
24	VtU6962	P.VIGNESH	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
25	VtU7083	CHERUKURI RAVI KUMAR	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
26	VtU6951	ANKIT JAISWAL	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
27	VtU6997	RESHMA SHAIK	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
28	VtU7432	KUNCHALA VENKATA SAI	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	A
29	VtU7810	PATTAPU PRASANTH	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	S
30	VtU7879	MUNAGALA VENKATA SUDHARSHAN REDDY	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	S
31	VtU8185	CHOPPARAPU KARUN SAGAR	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B

32	VtU6920	CHEEDELLA SAINATH	CSE	1157CS914	Practical Functional Programming with Haskell	Pass	B
33	VtU7242	KOMMINENI VAMSHI	CSE(DA)	1157CS914	Practical Functional Programming with Haskell	Pass	B
34	VtU7317	MUNAGALA BALA SESHAGIRI PRASAD	CSE(DA)	1157CS914	Practical Functional Programming with Haskell	Pass	C
35	VtU7262	KATUKURI VIJAY SAI	CSE(DA)	1157CS914	Practical Functional Programming with Haskell	Pass	B
36	VtU8370	THULLURI DANUSH CHOWDARY	CSE(DA)	1157CS914	Practical Functional Programming with Haskell	Pass	B
37	VtU7899	GAYATHRI CH	CSE(NW&CS)	1157CS914	Practical Functional Programming with Haskell	Pass	B
38	VtU8071	BUJJIREDDY ABHINAY KUMAR REDDY	CSE(NW&CS)	1157CS914	Practical Functional Programming with Haskell	Pass	B
39	VtU8339	ARYA AMITKUMAR SUNILPRASAD	CSE(NW&CS)	1157CS914	Practical Functional Programming with Haskell	Pass	B
40	VtU6941	NITESH MISHRA	CSE(NW&CS)	1157CS914	Practical Functional Programming with Haskell	Pass	A
41	VtU6909	SUNKARA VIJAYA RAMA RAO	CSE(NW&CS)	1157CS914	Practical Functional Programming with Haskell	Pass	C



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R&D Institute of Science and Technology
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Certificate of Completion

Mr. / Ms. pursuing
B.Tech. in Computer Science and Engineering at Vel Tech Rangarajan Dr.Sagunthala R&D Institute
of Science & Technology, Chennai has successfully completed the 20 hours specialized course on
“Practical Functional Programming with Haskell”.

Resource Person:

Prof. Dr. Jordi Petit Silvestre

Universitat Politecnica de Catalunya, Catalonia,
Spain.



TOPICS COVERED

- Introduction to functional programming
- Basics of Haskell
- Higher order functions
- Monads

Organized by

Department of Computer Science and Engineering
Duration: 15.03.2018 to 23.03.2018

Prof. Dr. Jordi Petit Silvestre
Resource Person

Dr. N. Malarvizhi
HoD - CSE

Prof. Dr. M. Munirathnam Naidu
Dean - SoC

Prof. Dr. techn.Koteswara Rao Anne
Director Academics

Prof. Dr. Beela Satyanarayana
Vice Chancellor



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

DJNT 103-18/015

346

Our Ref. No: 2018/VF 72 & 73

Your Ref. No:

Submitted for the Approval:

Name of the Professor: Prof. Dr. Jordi Petit Silvestre

University & Country : Universitat Politècnica de Catalunya, Spain

Course Titles : 1. Randomized Algorithms (20Hrs) ✓
2. Practical functional Programming with Haskell (20Hrs) ✓

Department : Computer Science and Engineering

Students : Course 1:2016-2020, 50 students ✓
2015-2019- 7 students ✓
Course 2:2016-2020, 52 Students ✓

Training Program date: Course 1: 15th to 23rd March, 2018 (FN)

Course 2: 15th to 23rd March, 2018 (AN)

Sl.No	Description	Amount in EURO	Amount in INR
1	Course Honorarium (Rs.3000 * 40Hrs) (Net Amount & Tax Free)	1499 ✓	120000 ✓
2	Visa Processing Charges (109.97 Euros) 1Euro= 79.657 as on 27.02.2018)	109.97 ✓	8760 ✓
Total		1608.97 ✓	128760 ✓

(Rupees one lakh twenty eight thousand seven hundred and sixty only) ✓

In this regard, I request your approval for transferring the amount in EURO to the following Account,

Name : Jordi Petit Silvestre ✓

Bank name: ING Direct ✓

Account No: ES25 1465 0120 38 1727584272 ✓

Branch: ING BANK NV, SPANISH ✓

Swift/BiC : INGDESMXXX ✓

Thank You,

S. Sivaperumal

Dr. S. Sivaperumal
Director International Relations

Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)



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(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

School of Computing
Department of Computer Science Engineering

Specialized one credit course on
“Randomized Algorithms”
(1157CS915)

by
Prof. Dr. Jordi Petit Silvestre
Universitat Politecnica De Catalunya, Spain



Held on
Date: March 15 to 23, 2018

Jordi Petit

Department of Computer Cience
Universitat Politècnica de Catalunya

CV

July 2017

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1 Personal information

Full name	Jordi Petit Silvestre
Birth date	November 30th, 1971
Nationality	Spaniard
Home address	C. Llobregat, 158 08904 L'Hospitalet de Llobregat Catalonia (Spain)
Mobile phone	+34 633 19 19 48
E-mail	jpetit@cs.upc.edu

2 Education

Feb 2001	<i>Doctor Enginyer en Informàtica</i> (PhD in Computer Science) Universitat Politècnica de Catalunya
Feb 1996	<i>Enginyer en Informàtica</i> (Higher Degree in Informatics Engineering) Facultat d'Informàtica de Barcelona Universitat Politècnica de Catalunya
Jul 1990	<i>Baccalauréat en Mathématiques et Sciences de la Nature</i> (French high school diploma in Mathematics and Sciences of Nature) Lycée Français de Barcelona

3 Languages

English	Excellent
French	Excellent
German	Beginner
Spanish	Native
Catalan	Native

4 Professional positions

Since Dec 2002

Professor Titular d'Universitat
(Associate Professor)
Departament de Ciències de la Computació
Universitat Politècnica de Catalunya

Dec 1999 to Nov 2002

Professor Associat a temps complert
(Full time Assistant Professor)
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya

Oct 1998 to Dec 1999

Professor Associat a temps parcial
(Part time Assistant Professor)
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya

Jun 1999 to Jul 2002 (sporadically)

Freelance web designer and programmer of philipglass.com for composer Philip Glass at Dunvagen Music Publishers, Inc.

Oct 1998 to Dec 1998

Part time programmer for the European Union project ALCOM-IT
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya

Feb 1996 to Oct 1998

Full time programmer for the European Union project ALCOM-IT
Departament de Llenguatges i Sistemes Informàtics
Universitat Politècnica de Catalunya
and
Paderborn Center for Parallel Computing
Universität Gasamthochschule Paderborn (Germany)

Sep 1993 to Jun 1995

Becari de Docència
(Teaching Fellow)
Facultat de Matemàtiques i Estadística
Universitat Politècnica de Catalunya

5 Honors and awards

Jan 2014	Positive evaluation of the teaching activity during the period 2009–2013 by the Agència per a la Qualitat del Sistema Universitari de Catalunya
May 2010	UPC Certification in recognition of special teaching merits
Jan 2009	Positive evaluation of the teaching activity during the period 2004–2008 by the Agència per a la Qualitat del Sistema Universitari de Catalunya
Jan 2009	Positive evaluation of the research activity during the period 2003–2008 by the Comisión Nacional Evaluadora de la Actividad Investigadora
Jan 2004	Positive evaluation of the teaching activity during the period 1998–2003 by the Agència per a la Qualitat del Sistema Universitari de Catalunya
Jan 2003	Positive evaluation of the research activity during the period 1998–2002 by the Comisión Nacional Evaluadora de la Actividad Investigadora
Aug 2002	Extraordinary Award from the Universitat Politècnica de Catalunya to the best PhD thesis defended during the course 2000-2001 in the area of Information Technologies and Communications
Feb 2001	European Doctor mention for the PhD Cum Laude by Unanimity mention for the PhD

6 Research projects

Projects founded by the European Union

FRONTS	<i>Foundations of Adaptive Networked Societies of Tiny Artefacts</i> EU FP7-ICT-2007-1 215270 (FET) 01/2008 to 03/2011
WISEBED	<i>Wireless Sensor Network Testbeds</i> EU FP7-ICT-2007-2 ICT-2007.1.6 (STREPS) 04/2008 to 03/2010
AEOLUS	<i>Algorithmic Principles for Building Efficient Overlay Computers.</i> EU IST-15964 (FET) 09/2005 to 09/2009
DELIS	<i>Dynamically Evolving, Large Scale Information Systems</i> EU FP6 Integrate Project 001907 (FET) 01/2004 to 12/2007
FLAGS	<i>Foundational Aspects of Global Computing Systems</i> EU FP5 IST-2001-33116 (FET) 01/2002 to 12/2004.
ALCOM-FT	<i>Algorithms and Complexity — Future Technologies</i> EU FP5 IST-1999-14186 (FET) 06/2000 to 06/2003
ALCOM-IT	<i>Algorithms and Complexity — Information Technologies</i> EU ESPRIT LTR 20244 02/1996 to 06/1999

Projects founded by Spanish ministries

COMMAS	<i>Modelos y métodos computacionales para datos masivos estructurados</i> TIN2013-46181-C2-1-R 01/2015 to 12/2017
FORMALISM	<i>Métodos formales y algoritmos para el diseño de sistemas</i> CICYT TIN2007-66523 01/2007 to 12/2012
TRACER	<i>Técnicas de Optimización Avanzadas para Problemas Complejos</i> CICYT TIC2002-04498-C05 12/2002 to 12/2005
MALLBA	<i>Geographically Distributed Environments: Combinatorial Optimization Library for Heuristic Methods</i> CICYT TIC99-0754-C03-02. 01/1999 to 1/2003

7 Publications in Journals

- J. Petit, S. Roura, J. Carmona, J. Cortadella, A. Duch, O. Giménez, A. Mani, J. Mas, E. Rodríguez-Carbonella, A. Rubio, J. de San Pedro, D. Venkataramani. Jutge.org: Characteristics and experiences. *IEEE Transactions on Learning Technologies*, page 1–1, 2017. DOI 10.1109/tlt.2017.2723389
- M. Blesa, A. Duch, J. Gabarró, J. Petit, and M. Serna. Economía aplicada al estudio de la evolución de un curso. *ReVisión*, 10(1), January 2017.
- M. Ruiz Costa-Jussà, L. Formiga, O. Torrillas, J. Petit, and J.A. Rodríguez Fonollosa. A MOOC on approaches to machine translation. *IRRODL*, 16(6), December 2015.
- J. Cortadella, J. Petit, S. Gómez, and F. Moll. A Boolean Rule-Based Approach for Manufacturability-Aware Cell Routing. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 33(3):409-422, March 2014.
- J. Petit. Addenda to the survey of layout problems. *Bulletin of the European Association for Theoretical Computer Science*, (105):177-201, 2011.
- L. Frias, J. Petit, and S. Roura. Lists revisited: Cache conscious STL lists. *ACM Journal of Experimental Algorithmics*, 14:5-27, 2009.
- J. Petit. Book review: Algorithms and Data Structures by K. Mehlhorn and P. Sanders. *Computer Science Reviews*, 3:47-51, 2009.
- C. Àlvarez, J. Díaz, J. Petit, J. Rolim, and M. Serna. High level communication functionalities for wireless sensor networks. *Theoretical Computer Science*, 406:240-247, 2008.
- C. Àlvarez, R. Cases, J. Díaz, J. Petit, and M. Serna. Communication tree problems. *Theoretical Computer Science*, 381:197-217, 2007.
- E. Alba, F. Almeida, M. Blesa, C. Cotta, M. Díaz, I. Dorta, J. Gabarró, C. León, G. Luque, J. Petit, C. Rodríguez, A. Rojas, and F. Xhafa. Efficient parallel LAN/WAN algorithms for optimization. *Parallel Computing*, 32:415-440, 2006.
- M. Blesa, J. Petit, and F. Xhafa. Generic parallel implementations for tabu search. *International Journal of Computer Systems Science and Engineering*, 21(6):413-432, 2006.
- J. Díaz, J. Petit, and M. Serna. A random graph model for optical smart dust networks. *IEEE Transactions on Mobile Computing*, 2(3):186-196, 2003.
- J. Petit. Combining spectral sequencing and parallel simulated annealing for the MinLA problem. *Parallel Processing Letters*, 13(1):77-91, 2003.
- J. Petit. Experiments on the minimim linear arrangement problem. *ACM Journal of Experimental Algorithmics*, 8, 2003.
- J. Díaz, J. Petit, and M. Serna. A survey on graph layout problems. *ACM Computing Surveys*, 34(3):313-356, 2002.
- J. Díaz, M. D. Penrose, J. Petit, and M. Serna. Approximating layout problems on random geometric graphs. *Journal of Algorithms*, 39(1):78-116, 2001.
- J. Díaz, J. Petit, and M. Serna. Faulty random geometric networks. *Parallel Processing Letters*, 10(4):343-357, 2001.
- J. Díaz, J. Petit, M. Serna, and L. Trevisan. Approximating layout problems on random graphs. *Discrete Mathematics*, 235(1-3):245-253, 2001.
- J. Díaz, M. D. Penrose, J. Petit, and M. Serna. Convergence theorems for some layout measures on random lattice and random geometric graphs. *Combinatorics, Probability and Computing*, 9(6):489-511, 2000.

8 Publications in Conferences

- A. Vidal-Obiols, J. Cortadella, and J. Petit. Under-the-cell routing to improve manufacturability. In *Proceedings of the on Great Lakes Symposium on VLSI 2017, GLSVLSI '17*, pages 125–130, 2017.
- M.J. Blesa, A. Duch, J. Gabarró, J. Petit, and M. Serna. Análisis de la evolución de un curso: productividad y desigualdad. In *Actas de las XXII Jornadas sobre Enseñanza Universitaria de la Informática*, volume 1, pages 161–168, 2016.
- M.J. Blesa, A. Duch, J. Gabarró, J. Petit, and M.J. Serna. Continuous assessment in the evolution of a CS1 course: The pass rate/workload ratio. In *Computer Supported Education - 7th International Conference, CSEDU 2015, Lisbon, Portugal, May 23-25, 2015, Revised Selected Papers*, volume 583 of *Communications in Computer and Information Science*, pages 313–332. Springer, 2015.
- A. Duch, J. Gabarró, J. Petit, M. J. Blesa, and M. J. Serna. A cost-benefit analysis of continuous assessment. In *Proceedings of the 7th International Conference on Computer Supported Education*, pages 57–66. SCITEPRESS, 2015.
- Marta R. Costa-jussà, Lluís Formiga, Jordi Petit, and José A. R. Fonollosa. Detailed description of the development of a MOOC in the topic of statistical machine translation. In Alexander Gelbukh, Félix Castro Espinoza, and Sofía N. Galicia-Haro, editors, *Human-Inspired Computing and Its Applications*, volume 8856 of *Lecture Notes in Computer Science*, pages 92–98. Springer International Publishing, 2014.
- A. Mani, D. Venkataramani, J. Petit, and S. Roura. Better feedback for educational online judges. In *Proceedings of the 6th International Conference on Computer Supported Education*, pages 176–183. SCITEPRESS, 2014.
- J. Cortadella, J. de San Pedro, N. Nikitin, and J. Petit. Physical-aware system-level design for tiled hierarchical chip multiprocessors. In *International Symposium on Physical Design (ISPD'13)*, pages 3–10, 2013.
- J. Cortadella, J. de San Pedro, N. Nikitin, and J. Petit. Physical planning for the architectural exploration of large-scale chip multiprocessors. In *7th International Symposium on Networks-on-Chip (NOCS 2013)*, 2013.
- A. Duch, J. Petit, E. Rodríguez-Carbonell, and S. Roura. Fun in CS2. In *Proceedings of the 5th International Conference on Computer Supported Education (CSEDU'13)*, pages 437–442. SCITEPRESS, 2013.
- J. Carmona, J. Cortadella, J. de San Pedro, and J. Petit. Integrating formal verification in an on-line judge for e-learning digital circuit design. In *Proc. of the 43rd ACM Technical Symposium on Computer Science Education (SIGCSE-2012)*, pages 451–456. Association for Computing Machinery, 2012.
- O. Giménez, J. Petit, and S. Roura. Jutge.org: An educational programming judge. In *Proc. of the 43rd ACM Technical Symposium on Computer Science Education (SIGCSE-2012)*, pages 445–450. Association for Computing Machinery, 2012.
- M. Blesa, J. Anguera, J. Farré, V. López, and J. Petit. Topology control algorithms in WISELIB. *ICSE Workshop on Software Engineering for Sensor Network Applications*, 0, 2010.
- L. Frias and J. Petit. Combining digital access and parallel partition for quicksort and quick-select. *ICSE Workshop on Multicore Software Engineering*, 0:33–40, 2009.
- O. Giménez, J. Petit, and S. Roura. Programació 1: A pure problem-oriented approach for a CS1 course. In C. Hermann, T. Lauer, T. Ottmann, and M. Welte, editors, *Proc. of the Informatics Education Europe IV (IEE-2009)*, pages 185–192, Freiburg, 2009. ISBN: 978-84-692-2758-9.

- J. Petit and S. Roura. Programación-1: Una asignatura orientada a la resolución de problemas. In I. Jacob and D. López, editors, XV Jornadas de Enseñanza Universitaria de la Informática, pages 185-192. ISBN: 978-84-692-2758-9, 2009.
- L. Frias and J. Petit. Parallel partition revisited. In C. McGeoch, editor, Experimental Algorithms, volume 5038 of Lecture Notes in Computer Science, pages 142-153, Berlin, 2008. Springer.
- J. Díaz, J. Petit, and D. Thilikos. Kernels for the vertex cover problem on the preferred attachment model. In C. Álvarez and M. Serna, editors, Experimental Algorithms, volume 4007 of Lecture Notes in Computer Science, pages 231-240, Berlin, 2006. Springer.
- L. Frias, J. Petit, and S. Roura. Lists revisited. In C. Álvarez and M. Serna, editors, Experimental Algorithms, volume 4007 of Lecture Notes in Computer Science, pages 121-133, Berlin, 2006. Springer.
- E. Levy, G. Louchard, and J. Petit. A distributed algorithm to find hamiltonian cycles in gnp random graphs. In A. López-Ortiz and A. Hamel, editors, First Workshop on Combinatorial and Algorithmic Aspects of Networking, CAAN 2004, volume 3405 of Lecture Notes in Computer Science, pages 63-74, Berlin, 2005. Springer-Verlag.
- C. Álvarez, J. Díaz, J. Petit, J. Rolim, and M. Serna. Efficient and reliable high level communication in randomly deployed sensor networks. In 2nd ACM International Workshop on Mobility Management and Wireless Access Protocols (MobiWac 2004), pages 106-110. ACM Press, 2004.
- G. Arzhantseva, J. Díaz, J. Petit, J. Rolim, and M. Serna. Broadcasting on networks of sensors communicating through directional antennas. In P. Spirakis, A. Kameas, and S. Nikolettseas, editors, International Workshop on Ambient Intelligence Computing, pages 1-12, CTI Press, 2003. Ellinika Grammata.
- J. Díaz, J. Petit, and M. Serna. Evaluation of basic protocols for optical smart dust networks. In K. Jansen, M. Margraf, M. Mastrolli, and J. Rolim, editors, Experimental and Efficient Algorithms, volume 2647 of Lecture Notes in Computer Science, pages 97-106, Berlin, 2003. Springer-Verlag.
- E. Alba, F. Almeida, M. Blesa, J. Cabeza, C. Cotta, M. Diaz, I. Dorta, J. Gabarró, C. León, J. Luna, L. Moreno, C. Pablos, J. Petit, A. Rojas, and F. Xhafa. MALLBA: A library of skeletons for combinatorial optimization. In B. Monien and R. Feldmann, editors, Euro-Par 2002 Parallel Processing, volume 2400 of Lecture Notes in Computer Science, pages 927-932, Berlin, 2002. Springer-Verlag.
- J. Petit. Hamiltonian cycles in faulty random geometric networks. In C. Kaklamanis, editor, Proceedings of the 2nd International Workshop on Approximation and Randomization Algorithms in Communication Networks (ARACNE 2001), volume 12 of Proceedings in Informatics, pages 97-110, Canada, 2002. Carleton Scientific.
- E. Alba, F. Almeida, M. Blesa, C. Cotta, M. Diaz, I. Dorta, J. Gabarró, J. González, C. León, L. Moreno, J. Petit, J. Roda, A. Rojas, and F. Xhafa. MALLBA: Towards a combinatorial optimization library for geographically distributed systems. In J. Duato, editor, Actas de las XII jornadas de paralelismo, number ISBN 84-9705-043-6 in Editorial Universitat Politècnica de València, pages 105-110, 2001.
- C. Álvarez, R. Cases, J. Díaz, J. Petit, and M. Serna. Routing trees for random graphs. In J. Rolim, editor, ICALP Workshops 2000, volume 8 of Proceedings in Informatics, pages 99-110, Canada, 2000. Carleton Scientific.
- J. Díaz, M. Penrose, J. Petit, and M. Serna. Linear ordering of random geometric graphs. In P. Wiedmayer and G. Neyer, editors, Graph Theoretic Concepts in Computer Science, volume 1665 of Lecture Notes in Computer Science, Berlin, 1999. Springer-Verlag.

- J. Díaz, M. D. Penrose, J. Petit, and M. Serna. Layout problems on lattice graphs. In T. Asano, H. Imai, D. T. Lee, S. Nakano, and T. Tokuyama, editors, *Computing and Combinatorics*, volume 1627 of *Lecture Notes in Computer Science*, pages 103-112, Berlin, 1999. Springer-Verlag.
- J. Díaz, J. Petit, P. Psycharis, and M. Serna. A parallel algorithm for sampling matchings from an almost uniform distribution. In Kyung-Yong Chwa and Oscar H. Ibarra, editors, *Algorithms and Computation*, number 1533 in *Lecture Notes in Computer Science*, pages 457-466, Berlin, 1998. Springer-Verlag.
- J. Díaz, J. Petit, and M. Serna. Random geometric problems on $[0,1]^2$. In J. Rolim, M. Luby, and M. Serna, editors, *Randomization and Approximation Techniques in Computer Science*, volume 1518 of *Lecture Notes in Computer Science*, pages 294-306, Berlin, 1998. Springer-Verlag.
- J. Petit. Approximation heuristics and benchmarkings for the MinLA problem. In R. Batiti and A. Bertossi, editors, *Alex '98 — Building bridges between theory and applications*, pages 112-128. Università di Trento, 1998.
- J. Gabarró and J. Petit. ParaDict, a data parallel library for dictionaries (extended abstract). In *Euromicro Workshop on Parallel and Distributed Processing*, pages 163-170. IEEE Computer Society Press, 1997.

9 Publications in Books

- M. J. Blesa, J. Petit, and F. Xhafa. Computación en Internet: Librería MALLBA para problemas de optimización. In *Ciencia y Tecnología*, volume II, pages 9-12. Tibidabo Ediciones, Barcelona, 2001. ISBN: 84-8033-145-3.
- J. Díaz, J. Petit, and M. Serna. A guide to concentration bounds. In S. Rajasekaran, P. Pardalos, J. Reif, and J. Rolim, editors, *Handbook on Randomized Computing*, volume II, chapter 12, pages 457-507. Kluwer Press, New York, 2001.

10 Scientific peer review activities

Book reviews

- J. Petit. *Book review: Algorithms and Data Structures by K. Mehlhorn and P. Sanders*. Computer Science Reviews, 3:47-51, 2009.

PhD jury

Jun 2012	H. Hernández (C. Blum, advisor) <i>Swarm Intelligence Techniques for Optimization and Management Tasks in Sensor Networks</i> Universitat Politècnica de Catalunya (Spain)
May 2011	E. García-Pardo (A. Duarte, J.J. Pantrigo, advisors) <i>El Problema de la Minimización de la Anchura de Corte en Ordenaciones Lineales: Resolución Exacta y Heurística</i> Universidad Rey Juan Carlos (Spain)
Mar 2009	E. Levy (J. Cardinal, advisor) <i>Approximation Algorithms for Covering Problems in Dense Graphs</i> Université Libre de Bruxelles (Belgium)

Reviewer for organizations

- Evaluation of research projects for the I+D Agustín de Betancourt programme (Universidad de La Laguna).

Reviewer for journals

- Algorithmica
- Computer Communications
- Computer-Aided Design
- Computers and Operation Research
- Discrete Applied Mathematics
- Discrete Optimization
- INFORMS Journal on Computing
- Journal of Experimental Algorithmics
- Journal on Parallel and Distributed Processing
- Official Journal of the Spanish Society of Statistics and Operations Research
- Official Journal of the Spanish Society of Statistics and Operations Research
- Optimization Letters
- Random Structures & Algorithms
- Theoretical Computer Science
- and others

Reviewer for conferences

- ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems
- Conference on Computer Aided Design
- EuroPar
- European Symposium on Algorithms
- IEEE/ACM International Conference on Computer-aided Design
- International Colloquium on Automata, Languages and Programming
- International Joint Conferences on Artificial Intelligence
- International Symposium on Experimental Algorithms

- International Workshop on Approximation Algorithms for Combinatorial Optimization
- International Workshop on Efficient and Experimental Algorithms
- International Workshop on Randomization and Approximation Techniques in Computer Science
- Latin American Theoretical Informatics
- and others

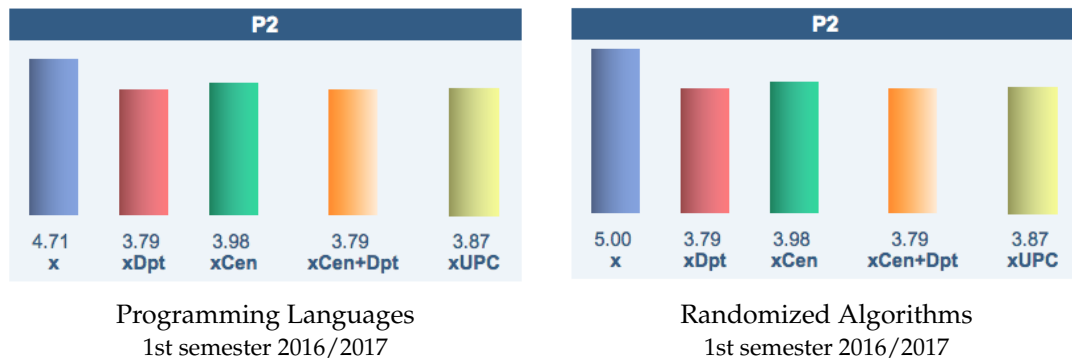
11 Teaching activities

Student evaluation

Official surveys show that my students appreciate my lectures and communication skills. For instance, the following figures show my results (x) for the question

"I think that the lecturer is a good teacher."

compared to the average in my department (xDpt), school (xCen) and university (xUPC) where the score ranges from 1 to 5:



All results are available under demand.

Tools

- Judge.org, the Virtual Learning Environment for Computer Programming.

Schools taught

- Facultat d'Informàtica de Barcelona (FIB)
- Facultat de Matemàtiques i Estadística (FME)
- Escola d'Enginyeria de Terrassa (EET)
- Escola Tècnica Superior d'Enginyeria i Aeronàutica de Terrassa (ETSEAT)

Graduate courses taught

- Randomized Algorithms (Master in Innovation and Research in Informatics)
- Advanced Topics in Distributed Computing (Master in Innovation and Research in Informatics)
- Seminari d'Algorísmica i Complexitat (PhD Program)
- Optimització Combinatòria (PhD Program)
- Programació de Telèfons i Dispositius Mòbils (Màster en Enginyeria Informàtica)

Undergraduate course taught

- Algorismes Paral·lels (FIB)
- Algorísmia (FIB)
- Algorísmia (FME)
- Anàlisi i Disseny d'Algorismes (FIB)
- Complementos de Programació (FME)
- Complementos d'Informàtica 1 (ETSEIAT)
- Esquemes Algorísmics (FIB)
- Estructures de Dades i Algorismes (FIB)

- Fonaments d'Informàtica (EET)
- Informàtica (FME)
- Informàtica Bàsica (ETSEIAT)
- Iniciació a la Programació (FIB)
- Llenguatges de Programació (FIB)
- Programació 1 (FIB)
- Programació Metòdica (FIB)
- Reptes de Programació (FIB)
- Seminari d'Algorísmica i Complexitat (LSI)
- Programming Summer Camps (UPC)

Theses advisor

When	Type	Student	Title
2013-2015	MSc	A. Vidal	SAT-based algorithms for internal cell routing
2010-2011	MSc	J. Farré	Algorithms for WISEBED
2008-2011	PhD	L. Frias	Data Structure Libraries

Advisor of end of studies projects

When	Student	Title
2017	A. Segarra	Extending a browser C++ simulator
2016	R. Gascons	A C++ interpreter in the browser
2016	A. Lobo	Editing, compiling, executing and debugging in the web
2015	M. Rius	Sistema de recomenacions per al Jutge
2015	D. Martí	Concurrency primitives in Haskell
2015	A. Moré	A game for EDA
2015	H. Ramon	Massive parallel game for EDA
2014	A. Vaca	Online platform for AI programming challenges
2013	D. Venkataramani	Heuristics for identifying common fail conditions
2013	A. Mani	A secured feedback system
2011	R. Martín	Traducción automática de programas para...
2011	V. López	Algorismes de topologia i sincronització en WSNs
2011	C. Molina	Aplicación web desarrollada con APEX
2009	J. Vives	Generació ordenada d'estructures combinatòries
2009	S. Vélez	Aplicación de formularios electrónicos basada en PCL
2009	A. Marín	Aplicación de formularios electrónicos basada en PCL
2007	L. de Lasasosa	Sameprinter 2.0
2005	E. Capdevila	Interficie web per grups de recerca
2005	L. Frias	Implementació dels MAP de la STL amb LBSTs
2003	M. Lobato	Repositori de programes i instàncies per MinLA
2002	J. Ferró	Paral·lelització d'un esquelet per a Simulated Annealing

Mentor of incoming international exchange students

When	Student	Origin
2016	M. Marlier	Institut Supérieur Industriel de Bruxelles (Belgium)
2013	A. Mani	SASTRA University (India)
2013	D. Venkataramani	SASTRA University (India)
2003	P. Agarwal	Indian Institute of Technology Delhi (India)

Courses for the industry

When	Course	For	Hours
2001/06	C, C++ i Java	Hewlett-Packard (Terrassa, Barcelona)	60
2001/06	Java bàsic	SONY (Viladecavalls, Barcelona)	30
2000/06	Curs de C++	SONY (Viladecavalls, Barcelona)	24

Activities on programming contests

- In 2017, consulting for HP CodeWars.
- Since 2007, organizing member of the *Olimpiada Informàtica Espanyola*.
- May 2005: Coach of the UPC teams for the emphPowered by U! contest organized by Sun and Ricoh (national winners).
- Since 2003, co-coach for the UPC teams that participate at ACM-ICPC contests (10 world finals in 12 years).

Course Proposal: *Randomized Algorithms*

Jordi Petit

Computer Science Department
Universitat Politècnica de Catalunya

Introduction

This document presents my proposal to deliver a course at Veltech Dr. RR & Dr. SR University in the context of the MoU signed between Veltech and UPC. This course shall be of interest for the students in Veltech's Computer Science & Engineering programmes. There is no need to say that I am open to discuss the topics and methodology of the proposal with the relevant professors at Veltech and the Veltech Academic Council in order to ensure that the course is well adapted to your studies.

Course description

The goal of this course is to present the power and the variety of randomized algorithms and to deep into the probabilistic analysis of algorithms.

A randomized algorithm is an algorithm that makes random choices as part of its logic. Probabilistic analysis of algorithms estimates the computational complexity of algorithms or problems assuming some probabilistic distribution of the set of all possible inputs. In most cases, the analysis of randomized algorithms is able to find similar results without facing worst case inputs.

The course has two main themes. The first theme presents basic tools and techniques from probability theory and probabilistic analysis that are recurrent in algorithmic applications. The second theme deals with specific areas of application. Tools and techniques will be interleaved with applications that illustrate them in concrete settings.

Teaching methodology

The course will follow this methodology:

- The lecturer will teach on the blackboard new concepts on probability theory and randomized algorithms and will present their application in algorithmic applications.
- The students will receive each day a small set of problems that they should try to solve for the next session. During that session, the lecturer will interact with the students who will discuss the various issues arising from their work.

Students

This course is geared towards advanced undergraduated students or graduate students who already are strong in algorithmics, data structures, and with some mathematical maturity.

Syllabus

The following topics will be covered:

1. **Introduction.** Motivating examples; random algorithms; probabilistic analysis; Monte Carlo algorithms, Las Vegas algorithms.
2. **Probabilistic tools and techniques.** Events and probabilities; random variables and expectations; moments and deviations; tail inequalities; balls, bins and random graphs; Markov chains and random walks.
3. **Sorting and searching.** Randomized quick sort; randomized quick select; randomized selection by sampling.
4. **Data structures.** Hashing; universal hashing, cuckoo hashing, bloom filters, skip-lists.
5. **Graph algorithms.** Minimal cuts; shortest paths; minimum spanning trees.
6. **Algebraic techniques.** Fingerprinting; database consistency; pattern matching; primality testing.
7. **Optimization, approximation and counting.**

Evaluation

The evaluation of the course will be on Day 6 and could last for 2 or 3 hours. Several problems (of the same type and difficulty as the ones worked during the course) will be presented to the students, who will have to solve them.

Factibility analysis

I have already taught the topics included in this proposal using the proposed methodology as part of the UPC course *Randomized Algorithms* during the last 4 semesters in the Master in Innovation and Research in Informatics at UPC. My notes are ready and have a big set of problems already prepared. The official pollings that UPC performs among the students of Randomized Algorithms have always been highly positive.

The main risk in the course is on the extend of the syllabus that may be covered depending on the student's background. I therefore propose to dynamically adapt the contents of the course to the student's needs and level.

Bibliography

The following books are recommended to complement this course to get more depth on the presented topics, but will not be necessary for the course:

- Mitzenmacher, Michael; Upfal, Eli. *Probability and computing: randomized algorithms and probabilistic analysis*. Cambridge University Press, 2005.
- Motwani, Rajeev; Raghavan, Prabhakar. *Randomized algorithms*. Cambridge University Press, 1999.
- Moore, Cristopher; Mertens, Stephan. *The Nature of computation*. Oxford University press, 2011.



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. n/s 3 of UGC Act, 1956)

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14/2/18 mvl
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Office of International Programmes
Visiting Professor Programmes

Details of Professor & Course:

Name of the Professor	Prof. Dr. Jordi Petit Silvestre (CV Attached)
University & Country	Universitat Politècnica de Catalunya, Spain ✓
Title of the Course	Randomized Algorithms ✓
Department	Computer Science and Engineering ✓
Dates of the Course	<u>March 15 to 23, 2018</u>
Total No. of Hours	20
No. of Credits	1
Course Content	Attached

Prepared by:

Coordinator – Office of Intl. Pgms

Forwarded by:

Director – Office of Intl. Pgms

Msh
10/2/18
HoD

mvl
14/2/18
Dean

Director (Academic)

Dr. S. Sivaperumal
Director International Relations
Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. n/s 3 of UGC Act, 1956)
S. S. L. S.
24.02.18
Vice Chancellor

SNo	Stu_Id	Stu_Name	Stu_Branch	Stu_Test_SubjectCode	Stu_Test_SubjectName	Stu_Subject_PassFail	Stu_Grade
1	VtU7198	JANANI AJITHA V	CSE	1157CS915	Randomized Algorithms	Pass	B
2	VtU7202	KUMMETHA VISHNU VARDHA	CSE	1157CS915	Randomized Algorithms	Pass	B
3	VtU8419	MOGAL JAKEER	CSE	1157CS915	Randomized Algorithms	Pass	B
4	VtU7418	PILLARI BENARJI REDDY	CSE	1157CS915	Randomized Algorithms	Pass	B
5	VTU5890	SHREYA KUMARI	CSE	1157CS915	Randomized Algorithms	Pass	B
6	VtU7045	GOPU LEKHANA	CSE	1157CS915	Randomized Algorithms	Pass	B
7	VtU8178	NULAKA DILEEP REDDY	CSE	1157CS915	Randomized Algorithms	Pass	A
8	VtU6957	ANUSHA GUNIREDDY	CSE	1157CS915	Randomized Algorithms	Pass	A
9	VtU6645	P. KALPANA	CSE	1157CS915	Randomized Algorithms	Pass	A
10	VtU8252	BADDIGA JEEVANKRISHNA	CSE	1157CS915	Randomized Algorithms	Pass	A
11	VtU7183	DASARI GOPIKRISHNA	CSE	1157CS915	Randomized Algorithms	Pass	A
12	VtU7316	KADDATI SAI PRASAD REDDY	CSE	1157CS915	Randomized Algorithms	Pass	A
13	VtU6893	KARAKAMBEDU PADMAJA	CSE	1157CS915	Randomized Algorithms	Pass	A
14	VtU7801	CHIKATIMARLA D M RADHA K	CSE	1157CS915	Randomized Algorithms	Pass	D
15	VtU6932	MADDI RAKESH	CSE	1157CS915	Randomized Algorithms	Pass	D
16	VTU6197	ANURAG CHAUHAN	CSE	1157CS915	Randomized Algorithms	Pass	D
17	VTU6416	CH. RAMIJUDDIN	CSE	1157CS915	Randomized Algorithms	Pass	D
18	VtU6964	THUMU PRAVEEN KUMAR RE	CSE	1157CS915	Randomized Algorithms	Pass	D
19	VTU6046	JAKKAPU JYOSTNAVYA	CSE	1157CS915	Randomized Algorithms	Pass	D
20	VTU6345	NABAJYOTI PAUL	CSE	1157CS915	Randomized Algorithms	Pass	D
21	VtU7762	RAVI KUMAR	CSE	1157CS915	Randomized Algorithms	Pass	D
22	VtU6999	NAGIREDDY SUJANA	CSE	1157CS915	Randomized Algorithms	Pass	C
23	VtU6485	GAURAV KUMAR	CSE	1157CS915	Randomized Algorithms	Pass	C
24	VtU6602	SHUBHAM KAUSHIK	CSE	1157CS915	Randomized Algorithms	Pass	C
25	VTU6281	SAKSHI TIWARI	CSE	1157CS915	Randomized Algorithms	Pass	C
26	VtU7061	SREERAMANENI BHAVYASRI	CSE	1157CS915	Randomized Algorithms	Pass	C
27	VtU7777	PITCHUKA VEGESH	CSE	1157CS915	Randomized Algorithms	Pass	C
28	VtU8265	MANCHALA SIRISHA	CSE	1157CS915	Randomized Algorithms	Pass	C
29	VtU8298	NALLA SAI TRINADH	CSE	1157CS915	Randomized Algorithms	Pass	C
30	VTU8125	ROHIT KUMAR MUDGAL	CSE	1157CS915	Randomized Algorithms	Pass	B
31	VtU7092	VATTIKUTI SRI MANI VINAY	CSE	1157CS915	Randomized Algorithms	Pass	B

32	VtU6440	SANYUKTA MEHTA	CSE	1157CS915	Randomized Algorithms	Pass	B
33	VtU6616	ANUP KUMAR	CSE	1157CS915	Randomized Algorithms	Pass	B
34	VtU8060	SAGALA RAGA VASUDHA	CSE	1157CS915	Randomized Algorithms	Pass	B
35	VtU7116	SHARUMATHI A	CSE	1157CS915	Randomized Algorithms	Pass	B
36	VtU8260	PULI SIVA REDDY	CSE	1157CS915	Randomized Algorithms	Pass	B
37	VtU8390	SHAIK NAGUR UMAR	CSE	1157CS915	Randomized Algorithms	Pass	B
38	VTU6272	RAJAT KUMAR	CSE	1157CS915	Randomized Algorithms	Pass	B
39	VtU8054	MOHIT KUMAR NAGUBANDI	CSE	1157CS915	Randomized Algorithms	Pass	A
40	VtU7196	MUNAGALA SREEKANTH REDD	CSE	1157CS915	Randomized Algorithms	Pass	A
41	VTU5931	ATUL	CSE	1157CS915	Randomized Algorithms	Pass	S
42	VtU7128	BOMMIREDDY VENKATA SUM	CSE	1157CS915	Randomized Algorithms	Pass	S
43	VtU7043	MALLI HEMANTH KRISHNA	CSE	1157CS915	Randomized Algorithms	Pass	S
44	VtU7163	GUTLAPALLI VEERA BABU	CSE	1157CS915	Randomized Algorithms	Pass	S
45	VtU8105	GADDAM LAKSHMIVARDHAN	CSE	1157CS915	Randomized Algorithms	Pass	S
46	VtU7950	M NAVEEN KUMAR	CSE	1157CS915	Randomized Algorithms	Pass	S
47	VTU6291	POOJARI JYOTHI MANJUNATH	CSE	1157CS915	Randomized Algorithms	Pass	B
48	VTU6510	SAURAV BISWAS	CSE	1157CS915	Randomized Algorithms	Pass	B
49	VtU7213	KOWTHARAPU SAI TEJESH	CSE(DA)	1157CS915	Randomized Algorithms	Pass	A
50	VtU7996	ALLAMANENI VENUGOPAL	CSE(DA)	1157CS915	Randomized Algorithms	Pass	C
51	VtU6907	DASARI VAMSI	CSE(DA)	1157CS915	Randomized Algorithms	Pass	C
52	VtU7504	BOGADI HEMANTH KUMAR	CSE(DA)	1157CS915	Randomized Algorithms	Pass	C
53	VtU6971	PEMMASANI PRUDHVI NADH	CSE(DA)	1157CS915	Randomized Algorithms	Pass	S
54	VtU7236	MUDUNURI SITA RAMA RAJU	CSE(DA)	1157CS915	Randomized Algorithms	Pass	S
55	VtU7270	BACHU SAI KUMAR	SE(NW&CS	1157CS915	Randomized Algorithms	Pass	C
56	VtU7281	POSSA NIKITHA	SE(NW&CS	1157CS915	Randomized Algorithms	Pass	B
57	VtU7020	PARVATHAREDDY PARTHASAR	SE(NW&CS	1157CS915	Randomized Algorithms	Pass	B
58	VtU7139	SHAIK HARSHAD	SE(NW&CS	1157CS915	Randomized Algorithms	Pass	B



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DJNT 103-18/015

346

Our Ref. No: 2018/VF 72 & 73

Your Ref. No:

Submitted for the Approval:

Name of the Professor: Prof. Dr. Jordi Petit Silvestre

University & Country : Universitat Politècnica de Catalunya, Spain

Course Titles : 1. Randomized Algorithms (20Hrs) ✓
2. Practical functional Programming with Haskell (20Hrs) ✓

Department : Computer Science and Engineering

Students : Course 1:2016-2020, 50 students ✓
2015-2019- 7 students ✓
Course 2:2016-2020, 52 Students ✓

Training Program date: Course 1: 15th to 23rd March, 2018 (FN)

Course 2: 15th to 23rd March, 2018 (AN)

Sl.No	Description	Amount in EURO	Amount in INR
1	Course Honorarium (Rs.3000 * 40Hrs) (Net Amount & Tax Free)	1499 ✓	120000 ✓
2	Visa Processing Charges (109.97 Euros) 1Euro= 79.657 as on 27.02.2018)	109.97 ✓	8760 ✓
	Total	1608.97 ✓	128760 ✓

(Rupees one lakh twenty eight thousand seven hundred and sixty only) ✓

In this regard, I request your approval for transferring the amount in EURO to the following Account,

Name : Jordi Petit Silvestre ✓

Bank name: ING Direct ✓

Account No: ES25 1465 0120 38 1727584272 ✓

Branch: ING BANK NV, SPANISH ✓

Swift/BiC : INGDESMXXX ✓

Thank You,

S. Sivaperumal

Dr. S. Sivaperumal
Director International Relations

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School of Computing

Department of Computer Science and Engineering

Specialized one credit course on

“Introduction to Competitive Programming with C++”

(1157CS964)

by

Prof. Dr. Jordi Petit Silvestre

Universitat Politècnica De Catalunya, Spain



**UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH**

Held on

Date: January 27 to 31, 2020

Jordi Petit

Department of Computer Science
Universitat Politècnica de Catalunya

jpetit@cs.upc.edu

Education

PhD in Computer Science, Universitat Politècnica de Catalunya, 2001.

Cum Laude by Unanimity and European Doctor mentions.

Higher Degree in Informatics Engineering, Universitat Politècnica de Catalunya, 1996.

Diploma in Mathematics and Sciences of Nature, Lycée Français de Barcelona, 1990.

Professional positions

Associate professor, Universitat Politècnica de Catalunya, 2002 to present.

Assistant professor, Universitat Politècnica de Catalunya, 1999-2002.

Freelance web developer for composer Philip Glass, 1999-2002 (sporadically).

Programmer, European Union project ALCOM-IT, 1996-1998.

Teaching fellow, Universitat Politècnica de Catalunya, 1993-1996.

Honors and awards

Extraordinary award to best PhD thesis in IT, Universitat Politècnica de Catalunya, 2001.

Certification of special teaching merits, Universitat Politècnica de Catalunya, 2010.

Positive periodical evaluations of teaching, Agència per a la Qualitat del Sistema Universitari de Catalunya.

Positive periodical evaluations of research, Comisión Nacional Evaluadora de la Actividad Investigadora.

Languages

English, French: Excellent.

Spanish, Catalan: Native.

German: Beginner.

Highlighted projects

Jutge.org, an educational online programming judge featuring static code analysis, formal verification and data-mining.

Design of placement and routing algorithms for the synthesis of VLSI standard cells and their implementation into CAD tools.

Parallel partition for quick-sort and quick-select on multicores, built into experimental GCC.

Cache conscious algorithms for lists, with STL compliant implementation.

ParaDict, a data parallel library for dictionaries on massively parallel and vectorial machines.
Graph algorithms in the WiseBed library for wireless sensor networks.
Heuristic skeletons for the Mallba optimization library for geographically distributed systems.
Design and implementation of the Philip Glass web site.

Highlighted scientific activities

Publications: 19 articles in international peer reviewed journals, 33 articles in peer reviewed conferences, 2 chapters in books. See <http://www.cs.upc.edu/~jpetit/#publications> for full list.

Project participation: 7 projects funded by the EU and 3 projects funded by Spanish agencies.

Community service: Member of 3 PhD committees. Reviewer for major international conferences and journals. Book review of *Algorithms and Data Structures* by K. Mehlhorn and P. Sanders.

Highlighted teaching activities

Advising: Theses advisor for one PhD and three MSc students. End of studies project advisor of 19 students. Mentor for 4 incoming international exchange students.

Graduate courses: Randomized algorithms, Advanced topics in distributed computing, Seminar on algorithms and complexity, Combinatorial optimization.

Undergraduate courses: Fundamentals of informatics, Programming 1, Programming 2, Methodology of programming, Algorithms, Design and analysis of algorithms, Data structures and algorithms, Parallel algorithms, Programming challenges, Programming phones and mobile devices.

Programmes: Bachelor Degree in Data Science and Engineering, Bachelor Degree in Informatics Engineering, Master in Innovation and Research in Informatics, Bachelor's degree in Mathematics, Bachelor's degree in Statistics, Bachelor's degree in Industrial Engineering.

Industrial courses: C++ and Java courses taught at HP and Sony.

Creation of several courses and adaptation of existing ones to the European Higher Education Area.

Organizing member of the **Olimpiada Informática Española** and co-organizer of the **Programming summer camps** at UPC.

Co-coach of the UPC teams for the **ACM-ICPC** contests (10 world finals in 12 years).

Excellent evaluations in official student surveys.

Course Proposal:

Introduction to Competitive Programming with C++

Jordi Petit

Computer Science Department
Universitat Politècnica de Catalunya

Introduction

This document presents my proposal to deliver a course titled *Introduction to Competitive Programming with C++* at Veltech Dr. RR & Dr. SR University. This course shall be of interest for the students in Veltech's Computer Science & Engineering undergraduate programmes.

Course description

Competitive programming involves several participants trying to quickly produce programs according to provided specifications. Individually or as a team, participants work to solve hard problems, fostering collaboration, creativity, innovation, and the ability to perform under pressure. As in any other discipline, in order to raise the bar on the possible in competitive programming, correct training is essential.

There are several organizations who host programming competitions on a regular basis. For instance, the International Collegiate Programming Contest (ACM ICPC) is the oldest, largest, and most prestigious programming contest in the world at the university level. Competitive programming is also recognized and supported by several multinational software and Internet companies, such as Google and Facebook. These companies regularly use competitive programming in order to headhunt and recruit highly skilled professionals.

The vast majority of problems appearing in programming contests are mathematical or logical in nature. Typical tasks belong to combinatorics, number theory, graph theory, geometry, string analysis and data structures. The process of solving a problem can be divided into two broad steps: devising an efficient algorithm to solve it, and implementing this algorithm in a suitable programming language.

C++ turns to be the most preferred language for competitive programming, due to its performance and the availability and power of its standard template library (STL). The STL has efficient implementation for common data structures (e.g. stacks, queues, priority queues, sets, maps, etc.) and common algorithms (e.g. sorting, searching, etc.). Also, C++ strikes the right balance between programming abstractions (such as objects, templates, classes etc.), implementation details (pointers, pass by value or reference, etc.) and hardware related issues (such as memory management, caches). Despite the fact that C++ is a huge language, its core is easy to learn for programmers who already know C, Java or Python. Finally, C++ has a lot of literature in the competitive programming domain.

The goal of this course is to introduce the basis of competitive programming using C++. It must be noted, though, that this course is only meant as an *introduction* to competitive programming. In order to participate and have success in programming contests, much more effort will be required: It takes a long time to become a good competitive programmer, but it is also an opportunity to learn a lot.

Teaching methodology

The course will be very practical: The classes will introduce new concepts, techniques, algorithms, data structures and implementations by the lecturer, and the students will practice on their own through exercises solved in front of the computer. Most exercises will use online programming judges such as *Jutge.org*, *UVa Online Judge* and *Codeforces*.

Students

This course is geared towards undergraduate students who already know basic programming, algorithms and data structures.

Syllabus

The following topics will be covered:

1. Introduction: Programming contests, how to practice, tools, sites, problem solving examples.
2. C++ refresher: essential elements, data structures, algorithms, the STL.
3. Mathematics: Algebra, number theory, combinatorics, geometry.
4. Graphs: Basic graph algorithms, shortest paths, network flows.
5. Backtracking: Examples, generation and optimization.
6. Dynamic programming: Examples, 1-dimensional and 2-dimensional DP.
7. String algorithms: String matching, Knuth-Morris-Pratt algorithm, suffix arrays.

Evaluation

The evaluation of the course will be on the last day and could last for a couple hours. Several exercises (of the same type and difficulty as the ones worked during the course) will be presented to the students, who will have to solve them.

Bibliography

The following books are recommended to follow this course and get more depth on the presented topics, but will not be necessary for the course:

- S. Skiena and M. Revilla, *Programming Challenges*. Springer, 2008.
- A. Laaksonen, *Competitive Programmer's Handbook*. Draft 2018. Available online at <https://cses.fi/book/book.pdf>.
- S. and F. Halim, *Competitive Programming, 3rd Edition*. Draft 2013. First edition is available online at <http://shorturl.at/joGLM>.

CSE-PR-1150
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DINT/09-19107

DA/13061
12/09/19
vc/19/1010
17/09/19



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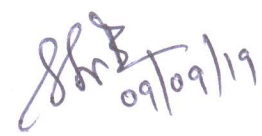
Directorate of International Relations
Visiting Professor Programmes

Details of Professor & Course:

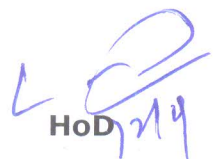
Name of the Professor	Prof. Dr. Jordi Petit Silvestre (CV Attached)
University & Country	Universitat Politècnica de Catalunya, Spain
Title of the Course	Introduction to Competitive Programming with C++ ✓
Department	Computer Science and Engineering
Dates of the Course	January 27 to 31, 2020 (<u>Two Batches</u>)
Total No. of Hours	15
No. of Credits	1
Category	Industry/ Higher Institute Learning
Course Content	Attached

Prepared by: 
9/9/19

Coordinator – Directorate of Intl. Relations

Forwarded by: 
09/09/19

Director – Directorate of Intl. Relations


HoD

Dr. V. Srinivasa Rao
Head of the Department
Computer Science and Engineering


Dean


Director (Academic)

Prof. Dr. techn. Koteswara Rao Anne
Director Academics


Vice Chancellor

Prof. V. S. S. Kumar
Vice Chancellor

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(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

SNo	Stu_Id	Stu_Name	Stu_Degree	Stu_Branch	Stu_Test_SubjectCode	Stu_Test_SubjectName	Stu_Subject_PassFail	Stu_Grade
1	VtU7843	SHAIK MOHAMMAD AZHARUDDIN	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
2	VtU10344	SHUBHAM YADAV	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
3	VtU10870	JWALA PRASAD SHAH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
4	VtU8776	BHIMAVARAM SAIMAHESH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
5	VtU10879	NITISH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	B
6	VtU12875	PANCHUMARTHI DILEEP KUMAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
7	VtU14834	KOTAKONDA SREENIVASULU	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
8	VtU12880	ATANU MANDAL	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
9	VtU10280	ANUBHAV SAHA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
10	VtU12912	BHUVANESH V	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
11	VtU10039	KAKARLA RAKESH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
12	VtU14740	ANGITI SANTHOSH REDDY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
13	VtU14741	ANGITI NAVEEN REDDY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
14	VtU9967	SAURAV KANT	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
15	VtU7875	DESHMUKH PRANAY KUMAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
16	VtU9689	KOMATIREDDY SAI VARDHAN REDDY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
17	VtU14280	PRAKASH KUMAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
18	VtU10799	MANISH AGARWAL	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
19	VtU6987	KASARAGADDA SAI MANI TEJA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
20	VtU6900	PAVITHRA G	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
21	VtU13601	NIDHI CHAURASIA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
22	VtU11642	ANIRUDH S	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A

SNo	Stu_Id	Stu_Name	Stu_Degree	Stu_Branch	Stu_Test_SubjectCode	Stu_Test_SubjectName	Stu_Subject_PassFail	Stu_Grade
23	VtU11173	PALLEN VENKATA SAI THARUN	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	B
24	VtU10715	ANKUSH TRIPATHI	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
25	VtU9105	T MOHAN SAI	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
26	VtU11666	SATWAT KUMAR AMBASHATA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
27	VtU6998	SUNKARA SATYANARAYANA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
28	VtU11340	BALAJI C	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
29	VtU8687	BALKRISHNA TRIPATHI	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
30	VtU14984	GEDELA SURESH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
31	VtU10670	PRAGYA SUKRITY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	NE	NE
32	VtU10666	ADARSH ROUNIYAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
33	VtU10121	KONDA NARESH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
34	VtU10543	AMRIT CHALISE	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
35	VtU13147	AMAN GOYANKA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
36	VtU11359	HARISH G	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
37	VtU6992	KASARAGADDA VINOD	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	B
38	VtU9525	PATHURI MANIKANTA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
39	VtU14285	TEAKALE RAGA VARSHINI	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
40	VtU11674	ANANYO CHAKRABARTY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
41	VtU10545	RIJAN ACHARYA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
42	VtU8032	SAGAR PRAJAPATI	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
43	VtU8291	TUMATI BALA TEJA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
44	VtU7364	CHEKURI PRUDVISH	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S

SNo	Stu_Id	Stu_Name	Stu_Degree	Stu_Branch	Stu_Test_SubjectCode	Stu_Test_SubjectName	Stu_Subject_PassFail	Stu_Grade
45	VtU12346	K M ANJALI JAISMAL	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
46	VtU11724	KLEMENDO PALA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
47	VtU10548	ABHISHEK PANDEY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	B
48	VtU14290	GOPISETTI SAI KUMAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	B
49	VtU14259	VENUTHURLA BHARGAVA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
50	VtU12864	SANIVARAPU NARSI REDDY	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	NE	NE
51	VtU7112	ANINDA DEB	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
52	VtU11704	ARPAN JANA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
53	VtU8366	ETIKYALA SAI CHAITANYA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
54	VtU8614	MAHESHKUMAR L	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
55	VtU8719	POGU SAIKUMAR	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
56	VtU12438	YENDRAPALLI VENKATA NAGA SIVA VARA PRASAD	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	A
57	VtU12845	SENNAMSETTY CHINNA DATTATREYA	B.Tech	CSE	1157CS964	Introduction to Competitive Programming with C++	Pass	S
58	VtU7748	PRASANN GUPTA	B.Tech	CSE(DA)	1157CS964	Introduction to Competitive Programming with C++	Pass	S
59	VtU10467	SUJEET MADHESHIYA	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	Pass	A
60	VtU10827	ANKITA SAGAR	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	NE	NE
61	VtU10833	K HARSHVARDHAN	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	NE	NE
62	VtU10780	AZAHARUDDIN ANSARI	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	Pass	A
63	VtU9657	HABEEBULLAH	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	Pass	S
64	VtU10261	ABHISHEK RAJ	B.Tech	CSE(NW&CS)	1157CS964	Introduction to Competitive Programming with C++	Pass	A



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

Our Ref. No: 2019-2020/VF 184

Your Ref. No:

Submitted for the Approval:

Name of the Professor: Prof. Dr. Jordi Petit Silvestre

University & Country : Universitat Politècnica de Catalunya, Spain ✓

Course Title : Introduction to Competitive Programming with C++
(2 batches x 15 Hrs each) ✓

Department : Computer Science and Engineering

Students : 56 students (Batch 1: 28 & Batch 2: 28) ✓

Program date : January 27 to 31, 2020

Sl.No	Description	Amount in INR	Amount in EURO
1	Course Honorarium (Rs.3000 * 30Hrs) (Net Amount & Tax Free)	90,000	1135 ✓
2	Visa Processing Charges (149.83 Euros) (1Euro= 79.29 INR)	11,880	149.83
	Total	101,880	1284.83

(Rupees one lakh eleven thousand eight hundred and eighty only)

In this regard, I request your approval for transferring the amount in EURO to the following Account,

Name : Jordi Petit

Bank Name: N26 GmbH

Account No: DE51100110012624156192

Branch: Kurfürstenstraße 72, 10787 Berlin, Germany

BIC : NTSBDEB1XXX

Thank You,

S. Sivaperumal

Director
International Relations

Entered in Budget Register

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Course Proposal:

Practical Functional Programming with Haskell

Jordi Petit

Computer Science Department
Universitat Politècnica de Catalunya

Introduction

This document presents my proposal to deliver a course titled *Practical Functional Programming with Haskell* at Veltech Dr. RR & Dr. SR University. This course shall be of interest for the students in Veltech's Computer Science & Engineering undergraduate programmes.

Course description

Functional programming is a programming paradigm where software is built by composing pure functions, avoiding shared state, mutable data, and side-effects. Whilst functional programming has only been considered an academic topic in the past, nowadays it is quickly becoming widespread. This is witnessed by the emergence of several functional programming languages such as OCaml, F#, Scala and their adoption in industrial settings.

Haskell is a functional programming language, based on formal mathematical principles. As such, it is easy to reason about and develop, and it executes efficiently on modern machines. Its power and its expressiveness make it an excellent tool to learn functional programming.

By the end of the course, the student will be able to:

- Understand the elements of the functional programming and apply them in ordinary programming tasks.
- Develop simple programs involving basic Haskell techniques, including pure functions and the IO monad.
- Understand concepts as higher order functions and lazy evaluation and solve common algorithmic problems using them.
- Model data through algebraic data types and apply recursion to define functions that traverse such types via pattern matching. Generalize types through classes.
- Apply simple formal methods to assert properties of functional programs.
- Get advantage of functional programming concepts when programming with imperative and object oriented programming languages such as Javascript or Python.

It must be noted, though, that the goal of the course is not to show each possible feature of Haskell, but rather, to show the power, elegance and simplicity of functional programming using it.

Teaching methodology

The course will be very practical: The classes will introduce new concepts by the lecturer, and students will practice on their own through exercises solved in front of the computer. An essential and distinctive feature of this course will be the use of *Jutge.org*, the UPC online programming judge: Students will have access to a well organized collection of exercises and will be able to submit their solutions to the judge, which will automatically issue a verdict on their correctness.

Students

This course is geared towards undergraduate students who already know imperative programming.

Syllabus

The following topics will be covered:

1. Introduction to functional programming: History, context, usages.
2. First steps in Haskell: Functions, basic types, lists, lazy evaluation.
3. Higher order functions: maps, folds, filters..., lambdas.
4. Data types: Recursive data types, pattern matching, infinite types.
5. Classes: Definition, derived instances.
6. Monads: do notation, the IO monad.
7. Conclusion.

Evaluation

The evaluation of the course will be on the last day and could last for a couple hours. Several exercises (of the same type and difficulty as the ones worked during the course) will be presented to the students, who will have to solve them.

Bibliography

The following books are recommended to follow this course and get more depth on the presented topics, but will not be necessary for the course:

- R. Bird, *Thinking Functionally With Haskell*. Cambridge University Press, 2015.
- M. Lipovaca, *Learn You a Haskell For Great Good*. No Starch Press, 2011. Available online at learnyouahaskell.com.
- B. O'Sullivan, J. Goerzen and D. Stewart. *Real World Haskell*, O'Reilly Media, 2008.