Work And Budget Plan

CA20111 Grant Agreement Period 2
01/11/2022 to 31/10/2023

Action Profile

Action General Information

Action Code	CA20111	MC Chair	Mr Frédéric Blanqui
Action Title	CA20111 - European Research Network on Formal Proofs		
MOU	051/21	Draft MOU	OC-2020-1-24593
CSO Approval Date	2021-05-25		
Action Start Date	11/10/2021	Action End Date	10/10/2025
Science Officer	Dr Ralph Stuebner	Administrative Officer	Ms Milena Stoyanova

Participation in the Action:

Number of	COST Full or Cooperating Members		COST Partner Members	Specific Organisations	Near Neighbour Countries	Third States	Total
Countries							
COST Members / Specific Organisations represented in the MC	34		0	0	n.a.	n.a.	34
	ITC	50%					
	Non-ITC	50%					
Countries represented in the Working Groups	35		0	0	1	5	41
	ITC	51%					
	Non-ITC	49%					
Individuals							
Nominated MC Members / MC Observers	56		0	0	n.a.	n.a.	56
	ITC	46%					
	Non-ITC	54%					
Approved Working Group members	286		0	0	1	14	301
	ITC	22%					
	Non-ITC	78%					

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Working Groups

	WG Title	WG Leader	Number of WG members
WG1	Tools for proof systems interoperability	Dr Jesper Cockx	97
WG2	Automated theorem provers	Prof Pascal Fontaine	114
WG3	Program verification	Dr Alicia Villanueva	152
WG4	Libraries of formal proofs	Dr Claudio Sacerdoti Coen	122
WG5	Machine learning in proofs	Dr Cezary Kaliszyk	80
WG6	Type theory	Dr Benedikt Ahrens	140

MoU objectives, Action deliverables and Grant Agreement Period Goals

Action Objectives from MoU

Aim/primary Objective
boost the interoperability and usability of proof systems
Secondary objectives
1. Express new proof systems in the Dedukti logical framework. 2. Promote the output of detailed, checkable proofs from automated theorem provers. 3. Make techniques for program verification more effective and more accessible to all stakeholders. 4. Gather proofs translated in Dedukti into a FAIR database. 5. Provide tools for searching large libraries of formal proofs. 6. Develop the use of artificial intelligence and machine learning techniques on proofs. 7. Develop a modular theory of type theories. 8. Develop the use of natural or controlled languages in proof systems. 9. Bring together members of the different communities working on proofs in Europe. 10. Act as a stakeholder platform in the field of formal proofs from its theoretical grounds to its industrial applications. 11. Create an excellent and inclusive network of researchers in Europe with lasting collaboration beyond the lifetime of the Action. 12. Ease access to formal verification techniques in education and other areas of science. 13. Actively support young researchers, the under-represented gender, and teams from regions with less capacity. 14. Transfer knowledge in terms of expertise, scientific tools and human resources across the different disciplines and between academia and industry. 15. Prepare competitive EU researchers for a fruitful career in an international environment through intensive use of Short Term Scientific Missions (STSM) and joint educational programs with industry. 16. Disseminate the results of the Action activities to the scientific community, the industry, the certification bodies, the European institutions and to the general public.

Action Deliverables

Deliverable	Month
1. D9 Database gathering proofs from the proof systems Coq, HOL-Light and Matita, and their translations.	12
2. D3 Inventory of automated theorem provers producing proofs, description of proof formats, and inventory of checking tools for these proof formats.	18
3. D5 Comparison of the approaches used in the international Software Verification competition SV-COMP.	18
4. D14 Definition of a mathematical framework for modular reasoning about type theories and their extensions.	18
5. D1 Release of software for translating proofs coming from important proof systems based on type theory like Isabelle, Agda, PVS, Lean or Minlog, to Dedukti and back.	24
6. D6 Software prototype for the automated inference of program specifications as logical axioms.	24
7. D10 Tools for managing the dependencies between proofs, and querying and searching the database.	24
8. D12 Detailed technical report on the evaluation of techniques for learning proof search guidance and premise selection in automated theorem provers.	30
9. D4 Software for translating proof formats used by automated theorem provers to Dedukti.	40
10. D2 Release of software for translating proofs coming from important proof systems based on set theory like Mizar, Atelier B or TLAPS to Dedukti and back.	48
11. D7 Collection of verification challenges with summary of working recipes for verifying them.	48
12. D8 Technique for syntax-semantics interface for program verification with or without type systems.	48
13. D11 Extension of the database and associated tools to other systems like Agda, Minlog, PVS, Lean, Mizar, Atelier B, TLAPS.	48
14. D13 White paper on including restricted natural language proof formats to existing proof libraries.	48
15. D15 Prototype implementation of the mathematical framework, with basic user interface, user documentation and gallery of examples of type theories.	48

Grant Agreement Period

Grant Agreement Period Start Date	01/11/2022	Grant Agreement Period End Date	31/10/2023

Grant Agreement Period Goals

Number	Grant Agreement Period Goal	MoU Objective(s) it relates to
GAPG 1	Finish the inventory of the automated theorem provers producing proofs, the formats used, and the corresponding checking tools	• Secondary objective 2 • Secondary objective 11 • Secondary objective 16
GAPG 2	Write an inventory of the approaches used in the international Software Verification competition SV-COMP	• Secondary objective 3 • Secondary objective 11 • Secondary objective 16
GAPG 3	Describe a mathematical framework for modular reasoning about type theories and their extensions	• Secondary objective 7 • Secondary objective 11 • Secondary objective 16
GAPG 4	Provide tools for translating proofs from Isabelle, Agda, PVS or Coq to Dedukti and back	• Challenge • Secondary objective 11
GAPG 5	Develop tools for generating Dedukti proofs from automated theorem provers and SMT solvers	• Challenge • Secondary objective 2 • Secondary objective 11
GAPG 6	Teach how to formalize mathematics using controlled natural languages	• Challenge • Secondary objective 8 • Secondary objective 11 • Secondary objective 12 • Secondary objective 14 • Secondary objective 15 • Secondary objective 16
GAPG 7	Support young researchers from inclusive-target countries	• Secondary objective 11 • Secondary objective 13
GAPG 8	Inform EuroProofNet members of gender biaises and advertize the work of women	• Secondary objective 13
GAPG 9	Train teachers on the use of proof systems in education	• Secondary objective 9 • Secondary objective 10 • Secondary objective 11 • Secondary objective 12 • Secondary objective 14 • Secondary objective 15 • Secondary objective 16
GAPG 10	Inventory the existing datasets for guided neuro-symbolic synthesis and discuss the development of new data sets	• Secondary objective 6 • Secondary objective 9 • Secondary objective 11
GAPG 11	Share practices on the efficient integration of machine-learning techniques in automated theorem provers	• Secondary objective 6 • Secondary objective 9 • Secondary objective 11
GAPG 12	Provide a tool for searching a database of proofs	• Secondary objective 3 • Secondary objective 5 • Secondary objective 9 • Secondary objective 12
GAPG 13	Specify the requirements for developing a software prototype for the automated inference of program specifications as logical axioms	• Secondary objective 3 • Secondary objective 9 • Secondary objective 11

GAPG 14	Report on the achievements of the action wrt to its objectives and planned deliverables	• Challenge • Secondary objective 1 • Secondary objective 2 • Secondary objective 3 • Secondary objective 4 • Secondary objective 5 • Secondary objective 6 • Secondary objective 7 • Secondary objective 8 • Secondary objective 9 • Secondary objective 10 • Secondary objective 11 • Secondary objective 12 • Secondary objective 13 • Secondary objective 14 • Secondary objective 15 • Secondary objective 16

Work and Budget Plan for the Grant Agreement Period

Work and Budget Plan Summary

A. COST Networking Tools	EUR
(1) Meetings	79,500.00
(2) Training Schools	25,540.00
(3) Mobility of Researchers and Innovators	35,000.00
(4) Presentation at Conferences organised by Third Parties	3,000.00
(5) Dissemination and Communication Products	0.00
(6) Other Expenses Related to Scientific Activities (OERSA)	0.00
B. Total Science Expenditure (sum of (1) to (6))	143,040.00
C. Financial and Scientific Administration and Coordination (FSAC) (max. of 15% of B)	21,456.00
Total Grant (B+C)	164,496.00

Meetings

Overview

Meeting Title	Meeting Type	Dates	Location	ITC	Total Cost (EUR)
Dedukti developers meeting 1	Workshops/Conferences	07/02/2023 - 09/02/2023	Val d'Ajol (France)	No	12,400.00
WG3 meeting	Working Group Meeting	08/02/2023 - 09/02/2023	Timisoara (Romania)	Yes	10,200.00
WG5 meeting on datasets for guided neuro-symbolic synthesis	Working Group Meeting	11/04/2023 - 12/04/2023	Prague (Czech Republic)	Yes	5,300.00
WG5 meeting on efficient learning for reasoning	Working Group Meeting	13/04/2023 - 13/04/2023	Prague (Czech Republic)	Yes	4,150.00
Dedukti developers meeting 2	Workshops/Conferences	09/05/2023 - 11/05/2023	Val d'Ajol (France)	No	12,400.00
WG6 meeting	Working Group Meeting	25/05/2023 - 26/05/2023	Utrecht (Netherlands)	No	10,450.00
WG4 meeting	Working Group Meeting	06/06/2023 - 07/06/2023	Cambridge (United Kingdom)	No	10,800.00
WG2 meeting	Working Group Meeting	03/07/2023 - 03/07/2023	Gif-sur-Yvette (France)	No	6,800.00
Women in EuroProofNet 2	Workshops/Conferences	31/07/2023 - 31/07/2023	Bialystok (Poland)	Yes	7,000.00
3rd Management Committee meeting	Management Committee Meeting	26/10/2023 - 26/10/2023	N/A	N/A	0.00
				Total	79,500.00

Details

Title of the Meeting	Dedukti developers meeting 1		
Meeting Type(s)	Workshops/Conferences		
Grant Period Goal(s) it will address	Provide tools for translating proofs from Isabelle, Agda, PVS or Coq to Dedukti and back,Develop tools for generating Dedukti proofs from automated theorem provers and SMT solvers,Provide a tool for searching a database of proofs		
Description	Meeting gathering developers of interactive or automated theorem provers, and search tools in proof libraries, to work in small groups on the development of tools for generating, transforming, translating and searching Dedukti files, and make progress towards the planned deliverables on Dedukti. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Software. Increased knowledge on Dedukti and the provers.		
Location	Val d'Ajol (France)	ITC	No
Start Date	2023-02-07 09:00:00	End Date	2023-02-09 17:00:00
Duration	3 days	Attendance Type	Face to face

Total number of expected participants	15	Number of participants expected to be reimbursed from COST funds	15
Daily allowance (EUR)	140.00	Average reimbursement (per participant) (EUR)	760.00
Average Long-Distance Costs	200.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	11,400.00		
Total unique participants to be accounted for LOS grant	15	Local Organiser Support (EUR)	1,000.00
Total cost of the meeting (EUR)	12,400.00		

Title of the Meeting	WG3 meeting		
Meeting Type(s)	Working Group Meeting		
Grant Period Goal(s) it will address	Write an inventory of the approaches used in the international Software Verification competition SV-COMP,Specify the requirements for developing a software prototype for the automated inference of program specifications as logical axioms		
Description	This WG3 meeting will allow the developers of software verification tools to meet and provide an overview of the approaches implemented in their tools, and discuss the automated inference of program specifications as logical axioms, and their automated verification by automated theorem provers or SMT solvers. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Inventory of the approaches used in the international Software Verification competition SV-COMP. Software prototype for the automated inference of program specifications as logical axioms.		
Location	Timisoara (Romania)	ITC	Yes
Start Date	2023-02-08 09:00:00	End Date	2023-02-09 17:00:00
Duration	2 days	Attendance Type	Face to face
Total number of expected participants	30	Number of participants expected to be reimbursed from COST funds	18
Daily allowance (EUR)	100.00	Average reimbursement (per participant) (EUR)	550.00
Average Long-Distance Costs	250.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	9,900.00		
Total unique participants to be accounted for LOS grant	30	Local Organiser Support (EUR)	300.00
Total cost of the meeting (EUR)	10,200.00		

Title of the Meeting	WG5 meeting on datasets for guided neuro-symbolic synthesis

Meeting Type(s)	Working Group Meeting		
Grant Period Goal(s) it will address	Inventory the existing datasets for guided neuro-symbolic synthesis and discuss the development of new data sets		
Description	Integrating guidance within systems handling various types of synthesis tasks remains stymied by the currently available datasets. Most datasets are either synthetic or lack more complex tasks. This is particularly problematic for approaches to program synthesis through inductive logic programming. The existence and development of datasets for guidance of automated and interactive theorem proving has lead to the recent breakthroughs and the explosion in approaches within the area. We aim to develop datasets that can lead to similar advancement. This workshop will focus on approaches to the development of datasets; discussion of existing datasets; discussion of synthesis problems lacking significant datasets and how the development of datasets may be approached; discussion of re-purposing existing datasets for guidance of synthesis problems; discussion of community effort development of datasets (e.g. the OEIS). The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Inventory of the existing datasets for guided neuro-symbolic synthesis.		
Location	Prague (Czech Republic)	ITC	Yes
Start Date	2023-04-11 09:00:00	End Date	2023-04-12 17:00:00
Duration	2 days	Attendance Type	Face to face
Total number of expected participants	20	Number of participants expected to be reimbursed from COST funds	10
Daily allowance (EUR)	100.00	Average reimbursement (per participant) (EUR)	500.00
Average Long-Distance Costs	200.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	5,000.00		
Total unique participants to be accounted for LOS grant	20	Local Organiser Support (EUR)	300.00
Total cost of the meeting (EUR)	5,300.00		

Title of the Meeting	WG5 meeting on efficient learning for reasoning		
Meeting Type(s)	Working Group Meeting		
Grant Period Goal(s) it will address	Share practices on the efficient integration of machine-learning techniques in automated theorem provers		
Description	Integrating machine learning techniques into automated reasoning systems still poses efficiency problems including language interfaces, representations and hardware demands. In this meeting we will exchange the gathered experiences among the practicioners and discuss optimization techniques for machine learning in theorem proving. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Better knowledge of existing techniques to efficiently integrate machine learning techniques in automated theorem provers.		
Location	Prague (Czech Republic)	ITC	Yes
Start Date	2023-04-13 09:00:00	End Date	2023-04-13 17:00:00

Duration	1 day	Attendance Type	Face to face
Total number of expected participants	20	Number of participants expected to be reimbursed from COST funds	10
Daily allowance (EUR)	100.00	Average reimbursement (per participant) (EUR)	400.00
Average Long-Distance Costs	200.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	4,000.00		
Total unique participants to be accounted for LOS grant	20	Local Organiser Support (EUR)	150.00
Total cost of the meeting (EUR)	4,150.00		

Title of the Meeting	Dedukti developers meeting 2		
Meeting Type(s)	Workshops/Conferences		
Grant Period Goal(s) it will address	Provide tools for translating proofs from Isabelle, Agda, PVS or Coq to Dedukti and back,Develop tools for generating Dedukti proofs from automated theorem provers and SMT solvers,Provide a tool for searching a database of proofs		
Description	Meeting gathering developers of interactive or automated theorem provers, and search tools in proof libraries, to work in small groups on the development of tools for generating, transforming, translating and searching Dedukti files, and make progress towards the planned deliverables on Dedukti. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Software. Increased shared knowledge on Dedukti and the provers.		
Location	Val d'Ajol (France)	ITC	No
Start Date	2023-05-09 09:00:00	End Date	2023-05-11 17:00:00
Duration	3 days	Attendance Type	Face to face
Total number of expected participants	15	Number of participants expected to be reimbursed from COST funds	15
Daily allowance (EUR)	140.00	Average reimbursement (per participant) (EUR)	760.00
Average Long-Distance Costs	200.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	11,400.00		
Total unique participants to be accounted for LOS grant	15	Local Organiser Support (EUR)	1,000.00
Total cost of the meeting (EUR)	12,400.00		

Title of the Meeting	WG6 meeting
Meeting Type(s)	Working Group Meeting

Grant Period Goal(s) it will address	Describe a mathematical framework for modular reasoning about type theories and their extensions		
Description	WG6 meeting to lay the foundations of a common mathematical framework for reasoning modularly on the syntax and semantics of type theories. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables of the actioni; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Report on the current status of the definition of a common mathematical framework for reasoning modularly on the syntax and semantics of type theories, and the problems that remain to be solved.		
Location	Utrecht (Netherlands)	ITC	No
Start Date	2023-05-25 09:00:00	End Date	2023-05-26 17:00:00
Duration	2 days	Attendance Type	Face to face
Total number of expected participants	40	Number of participants expected to be reimbursed from COST funds	15
Daily allowance (EUR)	140.00	Average reimbursement (per participant) (EUR)	670.00
Average Long-Distance Costs	250.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	10,050.00		
Total unique participants to be accounted for LOS grant	40	Local Organiser Support (EUR)	400.00
Total cost of the meeting (EUR)	10,450.00		

Title of the Meeting	WG4 meeting		
Meeting Type(s)	Working Group Meeting		
Grant Period Goal(s) it will address	Provide a tool for searching a database of proofs		
Description	This WG4 meeting will allow the developers of proof libraries and the developers of search tools to meet and discuss the techniques and tools that can be used to develop, maintain, refactorize and search large libraries of proofs. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Better knowledge of existing techniques and tools to solve the problems raised by the development, maintenance, refactoring and search of large libraries of proofs.		
Location	Cambridge (United Kingdom)	ITC	No
Start Date	2023-06-06 09:00:00	End Date	2023-06-07 17:00:00
Duration	2 days	Attendance Type	Face to face
Total number of expected participants	30	Number of participants expected to be reimbursed from COST funds	15
Daily allowance (EUR)	150.00	Average reimbursement (per participant) (EUR)	700.00

Average Long-Distance Costs	250.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	10,500.00		
Total unique participants to be accounted for LOS grant	30	Local Organiser Support (EUR)	300.00
Total cost of the meeting (EUR)	10,800.00		

Title of the Meeting	WG2 meeting		
Meeting Type(s)	Working Group Meeting		
Grant Period Goal(s) it will address	Finish the inventory of the automated theorem provers producing proofs, the formats used, and the corresponding checking tools,Develop tools for generating Dedukti proofs from automated theorem provers and SMT solvers		
Description	This WG2 meeting will bring together all users and develpers of automated theorem provers, discussing about standardization, current challenges and prospective applications, with a focus on proof formats. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: planned contributions to the objectives and deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Inventory of automated theorem provers producing proofs, description of proof formats, and inventory of checking tools for these proof formats.		
Location	Gif-sur-Yvette (France)	ITC	No
Start Date	2023-07-03 09:00:00	End Date	2023-07-03 17:00:00
Duration	1 day	Attendance Type	Face to face
Total number of expected participants	30	Number of participants expected to be reimbursed from COST funds	11
Daily allowance (EUR)	175.00	Average reimbursement (per participant) (EUR)	600.00
Average Long-Distance Costs	250.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	6,600.00		
Total unique participants to be accounted for LOS grant	30	Local Organiser Support (EUR)	200.00
Total cost of the meeting (EUR)	6,800.00		

Title of the Meeting	Women in EuroProofNet 2
Meeting Type(s)	Workshops/Conferences
Grant Period Goal(s) it will address	Inform EuroProofNet members of gender biaises and advertize the work of women

Description	This meeting aims at raising awareness of the community on gender biaises, advertizing the work of EuroProofNet women researchers, and sharing experiences and discussing concrete actions EuroProofNet members could try to do to interest girls in computer science and logic. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: gender; contributions to the objectives and deliverables; inclusive target countries; age; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Increased awareness of gender biaises. Positive models for young woman researchers. Learn experiences and ideas from others.		
Location	Bialystok (Poland)	ITC	Yes
Start Date	2023-07-31 09:00:00	End Date	2023-07-31 17:00:00
Duration	1 day	Attendance Type	Face to face
Total number of expected participants	40	Number of participants expected to be reimbursed from COST funds	17
Daily allowance (EUR)	50.00	Average reimbursement (per participant) (EUR)	400.00
Average Long-Distance Costs	300.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	6,800.00		
Total unique participants to be accounted for LOS grant	40	Local Organiser Support (EUR)	200.00
Total cost of the meeting (EUR)	7,000.00		

Title of the Meeting	3rd Management Committee meeting		
Meeting Type(s)	Management Committee Meeting		
Grant Period Goal(s) it will address	Report on the achievements of the action wrt to its objectives and planned deliverables		
Description	The core group will present the activities and results of the working groups and of the action for the current grant period, and present its work and budget plan for the next grant period.		
Output(s)	Report on the activities and results in the current grant period.		
Start Date	2023-10-26 14:00:00	End Date	2023-10-26 16:00:00
Duration	1 day	Attendance Type	Virtual
Total number of expected participants	50	Number of participants expected to be reimbursed from COST funds	0
Daily allowance (EUR)	0.00	Average reimbursement (per participant) (EUR)	0.00
Average Long-Distance Costs	0.00		
Total Travel, Accommodation and Subsistence Costs (EUR)	0.00		
Total unique participants to be accounted for LOS grant	50	Local Organiser Support (EUR)	0.00

Total cost of the meeting (EUR)	0.00

Training Schools

Overview

Title of the Training School	Dates	Location	ITC	Total Cost (EUR)
School on Teaching with Proof Assistants	03/07/2023 - 07/07/2023	Strasbourg (France)	No	14,560.00
School on Natural Language Formalizations	04/09/2023 - 08/09/2023	Bonn (Germany)	No	10,980.00
			Total	25,540.00

Details

Title of the Training School	School on Teaching with Proof Assistants		
Grant Period Goal(s) it will address	Train teachers on the use of proof systems in education		
Description	School about the use of proof assistants for teaching proof and proving, with people from didactics, mathematics and interactive theorem provers. We will have tutorials for Lean, Coq and Isabelle for example, talks by people developing large libraries, and talks on the didactics of proof and proving by didacticians of mathematics. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	School material (slides, videos, proof file examples). Knowledge on proof assistants and didactics.		
Location	Strasbourg (France)	ITC	No
Start Date	2023-07-03 09:00:00	End Date	2023-07-07 17:00:00
Duration	5 days	Attendance Type	Face to face
Participant information		Trainers	Trainees
• Daily allowance (EUR)		110.00	110.00
• Average Long-Distance Costs		250.00	
• Average reimbursement (EUR)		910.00	910.00
• Total number of expected trainers/trainees		5	30
• Trainers/trainees expected to be reimbursed from COST funds		2	14
Total Travel, Accommodation and Subsistence Costs (EUR)	14,560.00		
Total unique participants to be accounted for LOS grant	35		
Local Organiser Support (EUR)	0.00		
Total cost of the Training School (EUR)	14,560.00		

Title of the Training School	School on Natural Language Formalizations
Grant Period Goal(s) it will address	Teach how to formalize mathematics using controlled natural languages

Description	The natural language of mathematics can be restricted to a rich natural sublanguage with a fully formal non-ambiguous grammar. This allows to carry out strict formalizations in an intuive and readable language, which should make formal mathematics accessible to every mathematician. The Naproche system is a partial realization of these ideas. Current research is investigating whether the Naproche approach is also applicable to other formal mathematics systems like Isabelle. The proposed school will teach formalizing in Naproche through an intense tutorial with exercise classes. There will be supplementary lectures on underlying linguistic theories and techniques, on the type theory of Naproche, and on the perspectives of the use of natural language in formalization. The action members who will be reimbursed will be chosen by taking into account the following criteria in order: inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.		
Output(s)	Codified knowledge: Example formalizations to be included in a public repository. Tacit knowledge: Social interaction among COST action members from various working groups.		
Location	Bonn (Germany)	ITC	No
Start Date	2023-09-04 09:00:00	End Date	2023-09-08 17:00:00
Duration	5 days	Attendance Type	Face to face
Participant information		Trainers	Trainees
• Daily allowance (EUR)		110.00	110.00
• Average Long-Distance Costs		200.00	
• Average reimbursement (EUR)		860.00	860.00
• Total number of expected trainers/trainees		5	20
• Trainers/trainees expected to be reimbursed from COST funds		2	10
Total Travel, Accommodation and Subsistence Costs (EUR)	10,320.00		
Total unique participants to be accounted for LOS grant	25		
Local Organiser Support (EUR)	660.00		
Total cost of the Training School (EUR)	10,980.00		

Grant Period Goal(s) it will address:	Write an inventory of the approaches used in the international Software Verification competition SV-COMP,Describe a mathematical framework for modular reasoning about type theories and their extensions,Provide tools for translating proofs from Isabelle, Agda, PVS or Coq to Dedukti and back,Develop tools for generating Dedukti proofs from automated theorem provers and SMT solvers,Support young researchers from inclusive-target countries,Inventory the existing datasets for guided neuro-symbolic synthesis and discuss the development of new data sets,Share practices on the efficient integration of machine-learning techniques in automated theorem provers,Provide a tool for searching a database of proofs,Specify the requirements for developing a software prototype for the automated inference of program specifications as logical axioms	
Description:	The action members who will be granted will be chosen by taking into account the following criteria in order: importance wrt the research coordination objectives and planned deliverables; inclusive target countries; age; gender; team with low resources; balance over the action life time between people, teams, countries and working groups.	
Budget (EUR)	Short Term Scientific Missions (STSM) grants	35,000.00
	This budget would allow for approx. 18 STSM grants (based on the average costs per STSM grant spent by all Actions).	
	Virtual Mobility grants	0.00
	This budget would allow for approx. 0 Virtual Mobility grants (based on the average costs per VM grant spent by all Actions).	
	Total	35,000.00

Presentations at Conferences organised by Third Parties

Description:	Grants for young researchers from ITC countries for presenting a work related to the objectives of the action in well known international conferences of the domain (FSCD, ITP, CICM, CSL, LICS, POPL, CADE, SAT, ETAPS, etc.)	
Budget (EUR)	ITC Conference grants	3,000.00
	This budget would allow for approx. 3 ITC Conference grants (based on the average costs per ITC Conference grant spent by all Actions).	
	Dissemination Conference grants	0.00
	This budget would allow for approx. 0 Dissemination Conference grants (based on the average costs per DC grant spent by all Actions).	
	Total	3,000.00