

**Proposal number: 174444-051**

**Proposal name: Character Territoriality: Social Spatial Reasoning for Digital Actors**

**Proposal type: IRF - Project Grant**

**1 Participants**

**1.1 Principal investigator(s)**

ID number	0309725469
Name	Hannes Högni Vilhjálmsson
E-mail	hannes@ru.is
Gender	Male
Academic degree	Doctorate /or equivalent
Position	Senior personnel 2 (e.g. associated professor)
Institute	Reykjavik University-School of Computer science
Telephone	6186323

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0
2018	0.0	0
2019	0.0	0
Total	0.0	0

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	4.0	2880
2018	4.0	2966

the Icelandic Research Fund (IRF) 2017

2019	4.0	3055
Total	12.0	8901

Explain salaries financed by others
Part of full employment at Reykjavik University.

**1.2 Upload attachment - CV principal investigator(s)**

Filename	cv-vilhjalmsson.pdf
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**1.3 Co-proposer(s)**

ID-number	2404803799
Name	Claudio Pedica
Gender	Male
Academic degree	Mastersdegree /or equivalent
Position	Researcher
Institute	Reykjavik University-School of Computer science
Telephone	8683756
E-mail	claudio07@ru.is

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)
2017	4.0	1520
2018	4.0	1566
2019	4.0	1613
Total	12.0	4699

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand

the Icelandic Research Fund (IRF) 2017

		ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
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**1.4 Upload attachment -CV co-proposer(s)**

Filename	cv-pedica.pdf
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**1.5 Graduate student(s)**

ID number	0
Name	TBD
Gender	-- Nothing selected --
Current academic degree	Bachelorsdegree / or equivalent
Masters or Ph.D. study	Mastersdegree /or equivalent

Supervisor and institute
Hannes Högni Vilhjálmsson at Reykjavik University.

Start of study (year)	2016
End of study (year)	2017

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)
2017	6.0	2040
2018	0.0	0
2019	0.0	0

the Icelandic Research Fund (IRF) 2017

Total	6.0	2040
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Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
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ID number	0
Name	TBD
Gender	-- Nothing selected --
Current academic degree	Bachelorsdegree / or equivalent
Masters or Ph.D. study	Mastersdegree /or equivalent

Supervisor and institute
Hannes Högni Vilhjálmsson at Reykjavik University.

Start of study (year)	2017
End of study (year)	2018

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0
2018	6.0	2101

the Icelandic Research Fund (IRF) 2017

2019	0.0	0
Total	6.0	2101

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
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ID number	0
Name	TBD
Gender	-- Nothing selected --
Current academic degree	Bachelorsdegree / or equivalent
Masters or Ph.D. study	Mastersdegree /or equivalent

Supervisor and institute
Hannes Högni Vilhjálmsson at Reykjavik University.

Start of study (year)	2018
End of study (year)	2019

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0

the Icelandic Research Fund (IRF) 2017

2018	0.0	0
2019	6.0	2164
Total	6.0	2164

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
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ID number	0
Name	TBD
Gender	-- Nothing selected --
Current academic degree	Mastersdegree /or equivalent
Masters or Ph.D. study	Doctorate /or equivalent

Supervisor and institute
Hannes Högni Vilhjálmsson at Reykjavik University

Start of study (year)	2017
End of study (year)	2019

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)

the Icelandic Research Fund (IRF) 2017

2017	12.0	4560
2018	12.0	4697
2019	12.0	4838
Total	36.0	14095

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
-------------------------------------

ID number	0
Name	TBD
Gender	-- Nothing selected --
Current academic degree	Mastersdegree /or equivalent
Masters or Ph.D. study	Doctorate /or equivalent

Supervisor and institute
Hannes Högni Vilhjálmsson at Reykjavik University

Start of study (year)	2017
End of study (year)	2019

Requested salaries		
Year	Number of man-months	Salaries (in thousand

the Icelandic Research Fund (IRF) 2017

		ISK)
2017	12.0	4560
2018	12.0	4697
2019	12.0	4838
Total	36.0	14095

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.0	0.0
2018	0.0	0.0
2019	0.0	0.0
Total	0.0	0.0

Explain salaries financed by others
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**1.6 Research assistant(s)**

**1.7 Other participant(s)**

ID number	
Name	Catherine Pelachaud
Gender	Female
Academic degree current	Doctorate /or equivalent
Position	Senior personnel 1 (e.g. full professor)
Institute	Other
ID number institute/company	
Institute/company	TELECOM ParisTech

Requested salaries		
Year	Number of man-months	Salaries (in thousand



the Icelandic Research Fund (IRF) 2017

		ISK)
2017	0.0	0
2018	0.0	0
2019	0.0	0
Total	0.0	0

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.5	378.0
2018	0.5	389.0
2019	0.5	400.0
Total	1.5	1167.0

Explain salaries financed by others
Part of salaries for a full time faculty position.

ID number	
Name	Takehiko Nagakura
Gender	Male
Academic degree current	Doctorate /or equivalent
Position	Senior personnel 2 (e.g. associated professor)
Institute	Other
ID number institute/company	
Institute/company	Massachusetts Institute of Technology

Requested salaries		
Year	Number of man-months	Salaries (in thousand

the Icelandic Research Fund (IRF) 2017

		ISK)
2017	0.0	0
2018	0.0	0
2019	0.0	0
Total	0.0	0

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.5	360.0
2018	0.5	371.0
2019	0.5	382.0
Total	1.5	1113.0

Explain salaries financed by others
Part of salaries for a full time faculty position.

ID number	4910141130
Name	Kjartan Pierre Emilsson
Gender	Male
Academic degree current	Doctorate /or equivalent
Position	Senior personnel 1 (e.g. full professor)
Institute	Other
ID number institute/company	4910141130
Institute/company	Sólfar Studios ehf.

Requested salaries		
Year	Number of man-months	Salaries (in thousand ISK)

the Icelandic Research Fund (IRF) 2017

2017	0.0	0
2018	0.0	0
2019	0.0	0
Total	0.0	0

Salaries financed by others		
Year	Number of man-months	Salaries (in thousand ISK)
2017	0.5	378.0
2018	0.5	389.0
2019	0.5	400.0
Total	1.5	1167.0

Explain salaries financed by others
Covered by regular company operations.

## 1.8 Upload attachment - letter of intent

Filename	intent-paristech.pdf
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## 2 Project

### 2.1 Project

Title in Icelandic	Svæðisvitun Persóna: Stafrænum leikurum gert kleyft að skilja og nýta félagslegt rými
Title in English	Character Territoriality: Social Spatial Reasoning for Digital Actors
Expert panel	Engineering and technical sciences

Scientific category	Computer and information sciences
Is the proposal multidisciplinary?	No
Has the proposal previously been submitted to RANNIS?	yes
Is the PI submitting more than one proposals to the fund for the grant year 2017?	Yes
Title of other proposal	Virtual Reality Based Assessment and Treatment of Contextual Anxiety: Psychophysiology and Personality Vulnerability Factors
Explain any relationship between the proposals	No direct relationship, though digital actors could contribute to the study of social anxiety.
Keyword Icelandic 1	Hermun
Keyword Icelandic 2	Persónur
Keyword Icelandic 3	Svæðisvitund
Keyword Icelandic 4	Kvikun
Keyword Icelandic 5	Hópar
Keyword English 1	Simulation
Keyword English 2	Territoriality
Keyword English 3	Characters
Keyword English 4	Animation
Keyword English 5	Groups

## 2.2 Upload attachment - project description

Filename	charter-project.pdf
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## 2.3 Upload attachment - project description reference list

Filename	charter-project-bibliography.pdf
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## 2.4 Abstract and Milestones

English
<p>We propose to push the boundaries in modeling and synthesis of social character behavior by enriching the state-of-the-art with socio-territorial reasoning and spatial knowledge. Our approach aims to make digital characters more believable as well as deepen our understanding of human social behavior. As characters become more believable, interaction with them becomes more natural and the stories they populate more effective. Fundamental components for character automation include a navigation system and an animation system. While these components may produce natural movement they ignore social interaction, resulting in motion that is out of place when multiple characters occupy a space. We will wrap these two components in a third one that mimics how people reason about social space. The approach is based on the qualitative representation of space as described by theories of human territories, f-formation and proxemics. The work builds on our successful platform for reactive social intelligence and specifically addresses outstanding challenges: (1) Territorial Motion Interface, (2) Arbitration of Conflicting Socio-Territorial Movement, (3) Synchronization and Temporal Reasoning and (4) Representing and Reasoning about Context. Our methodology includes iterative design, fast prototyping, and subject evaluations of results. TELECOM ParisTech, MIT and Sólfar will be close collaborators, contributing expertise and applying the results.</p>
Icelandic
<p>Verkefnið bætir sjálfvirka kvikun stafrænna persóna með því að taka inn í myndina félagslega svæðisvitund og rýmisþekkingu. Aðferðin miðar að því að gera persónurnar meira sannfærandi en einnig að dýpka skilning okkar á mannlegu atferli. Því meira sannfærandi sem persóna er því eðlilegri verða samkiptin við hana og söguheimur þeirra áhrifameiri. Grunnstoðir sjálfvirkar hegðunar hjá starfrænum persónum eru annars vegar flakkerfi og hinsvegar kvikunarkerfi. Þessi kerfi til samans geta myndað eðlilega hreyfingu gegnum umhverfi en þau taka ekki tillit til félagslegra samskipta, og því getur hegðunin virst óeðlileg þegar fleiri persónur eru í rýminu. Við munum umlykja þessi kerfi með þriðja stoðkerfinu sem hermir eftir félagsrýmisvitund fólks.</p>

<p>Þessi rýmisvitund mun byggja á þekktum kenningum um mannlega svæðisvitund, f-hópun og nálægð. Við munum byggja á félagshermikerfi okkar sem hefur þegar gefið góða raun, en einblína á fjórar áskoranir sem eftir standa: (1) Hreyfiviðmót svæðisvitundar, (2) Leysa úr árekstri svæðishegðunar, (3) Samræming og tímaskynjun og (4) Framsetning og nýting samhengis. Í aðferðarfræði okkar felst ítruð hönnun, hröð frumgerðasmíð og notendaprófanir. TELECOM ParisTech, MIT og Sólfar vinna náið með okkur, leggja til sérþekkingu og hagnýta niðurstöðurnar.</p>
<p>Milestones (1st year)</p>
<p>Prototype of Scenario 1 related to research challenge 1 (Territorial Motion Interface). Results and write-up of a study based on the Scenario 1 prototype. Prototype of Scenario 2 related to research challenge 2 (Arbitration of Conflicting Socio-Territorial Movement).</p>
<p>Milestones (2nd year)</p>
<p>Prototype of Scenario 3 related to research challenge 1 (Territorial Motion Interface) and research challenge 2 ((Arbitration of Conflicting SocioTerritorial Movement) in combination. Results and write-up of a study based on the Scenario 3 prototype. Prototype of Scenario 4 related to research challenge 3 (Synchronization and Temporal Reasoning).</p>
<p>Milestones (3rd year)</p>
<p>Prototype of Scenario 5 related to research challenge 4 (Representing and Reasoning about Context). Results and write-up of a study based on the Scenario 5 prototype. Prototype of Scenario 6 related to all research challenges. Write-up of overall results.</p>

## 2.5 Non-preferred reviewer(s)

Name	Previous Anonymous Reviewer (1 of 4)
Affiliation	Not disclosed to us.
Reason for request	One of the 4 external reviewers of the original proposal submitted last year provided a particularly brief and poorly

	argued review that indicated lack of understanding and effort. When assigning reviewers for this updated proposal, re-using reviewers is fine, but we ask you avoid the obvious low quality reviewer.
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### 3 Cost and financing

#### 3.1 Project accounting

ID number institute/company	5101054190
Institute/company	Reykjavik University-School of Computer science
Person responsible	Jóhann Hjartarson
E-mail	johannah@ru.is

#### 3.2 Operational expenses

Year	Requested (in thousand ISK)
2017	140
2018	140
2019	140
Total:	420

Year	Other financing (in thousand ISK)
2017	0
2018	0
2019	0
Total:	0

Detailed explanation of cost
Unity Plus software engine license (\$400/seat/year) and additional advanced plug-in software components such as for inverse kinematics and animation.

### 3.3 Contracted services

### 3.4 Travel expenses

Year	Requested (in thousand ISK)
2017	990
2018	990
2019	1140
Total:	3120

Year	Other financing (in thousand ISK)
2017	0
2018	0
2019	0
Total:	0

Detailed explanation of cost
<p>Two workshops in Iceland for collaborators in first two years, which includes flight and hotel for 2 people from Paris and 2 people from Boston (flights: <math>2 \times 100 + 2 \times 50 = 300</math>, hotel: <math>4 \times 20 \times 3 \text{ days} = 240</math>), plus incidental cost such as local travel and food (100). Two conference trips for one person during the first two years (flight: <math>2 \times 100 = 200</math>, fee: 50, hotel: <math>20 \times 5 = 100</math>) and then two conference trips for two people in the final year (flight: <math>2 \times 2 \times 100 = 400</math>, fee: <math>2 \times 50 = 100</math>, hotel: <math>2 \times 20 \times 5 = 200</math>). Final year includes visit to MIT for RU PIs for presenting results (flights: <math>2 \times 100 = 200</math>, hotel: <math>2 \times 20 \times 3 = 240</math>).</p>

### 3.5 Upload attachment(s) - price quote(s)

### 3.6 Overhead

Year	Requested overhead (in thousand ISK)
2017	3452
2018	3547
2019	3683



the Icelandic Research Fund (IRF) 2017

Total:	10682
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Detailed explanation of cost
Cost of office and equipment infrastructure.

### 3.7 Budget plan for the project period

Cost item	Requested funding	Other financing	Total
Salaries	12680	3996	16676
Operational expenses	140	0	140
Contracted services	0	0	0
Travel expenses	990	0	990
Total 2017	13810	3996	17806
Overhead	3452	0	3452
Total cost including overhead	17262	3996	21258
Salaries	13061	4115	17176
Operational expenses	140	0	140
Contracted services	0	0	0
Travel expenses	990	0	990
Total 2018	14191	4115	18306
Overhead	3547	0	3547
Total cost including overhead	17738	4115	21853
Salaries	13453	4237	17690
Operational expenses	140	0	140
Contracted	0	0	0

services			
Travel expenses	1140	0	1140
Total 2019	14733	4237	18970
Overhead	3683	0	3683
Total cost including overhead	18416	4237	22653
Publication cost	0	0	0
Total overhead	10682	0	10682
Total cost of project excluding overhead	42734	12348	55082
Total cost of project including overhead	53416	12348	65764