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Ministero
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Italiadomani

PIANO NAZIONALE
DI RIPRESA E RESILIENZA



Centro Nazionale di Ricerca in HPC,
Big Data and Quantum Computing

AI-Visio-Lab

Stefano Germani, Università degli Studi di Perugia

Spoke 3 Progetti Bandi a Cascata, 24/09, 2024

Contact Person:

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Stefano Borgani <stefano.borgani@inaf.it>

Project Aim

To develop a comprehensive suite of tools capable of processing, analyzing, modeling, and visualizing large-scale astrophysical and geophysical data in an immersive, efficient, and accessible way

HW

SW Development &
SW Prototyping



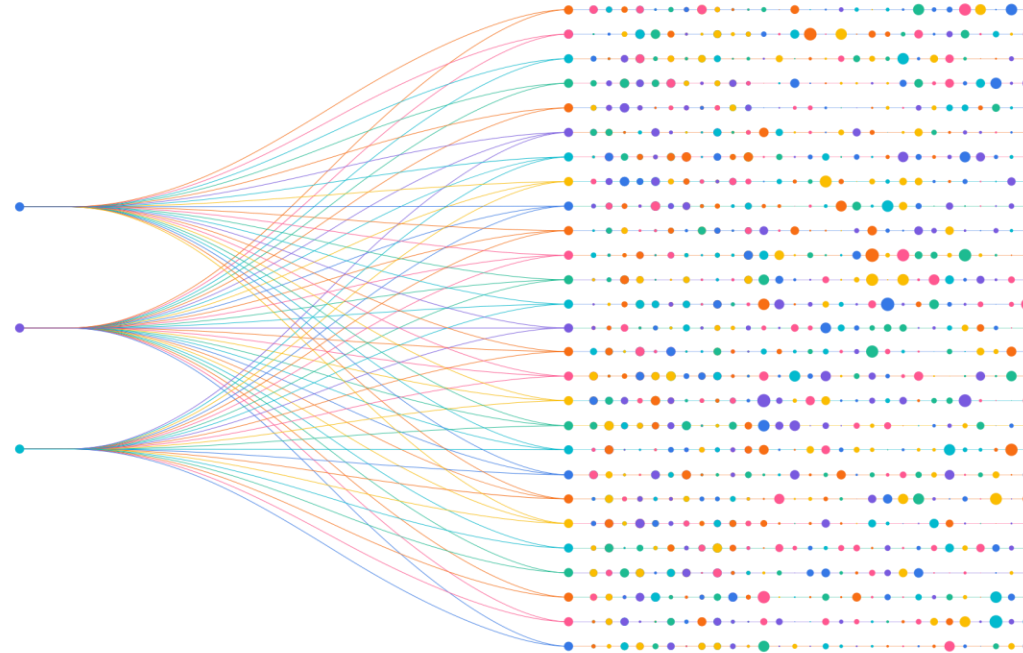
WP 4-4 - UniPG

'Information Science and
High-Performance
Computing'

Plan of collaborative and
cross-cutting actions

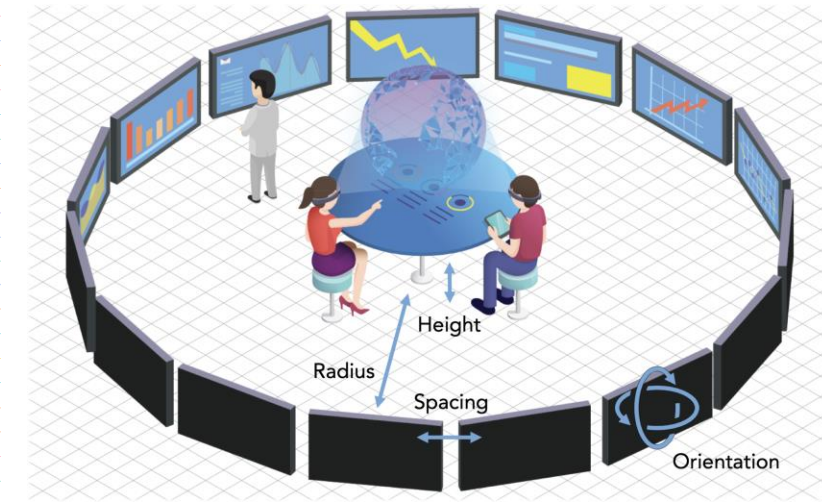
SW

Libraries for Data Analysis
Modelling & Visualization

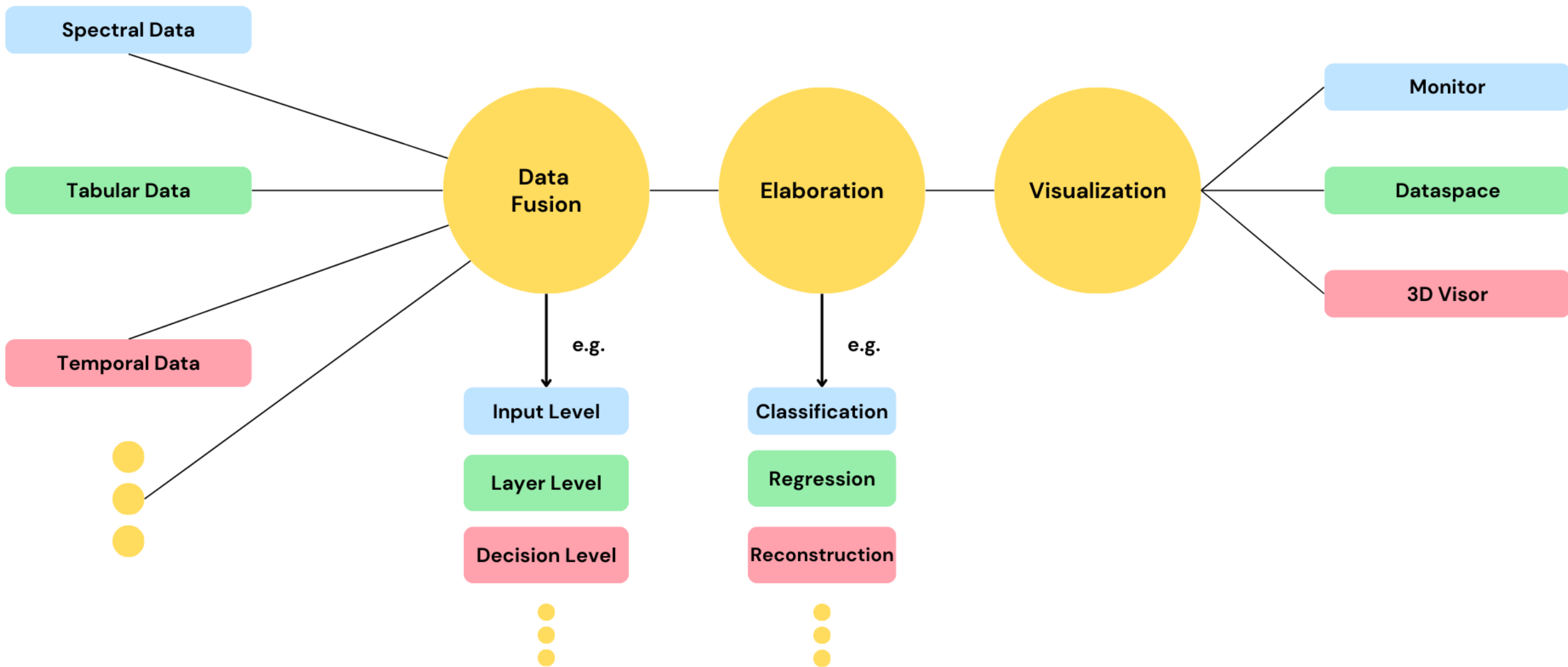


HW

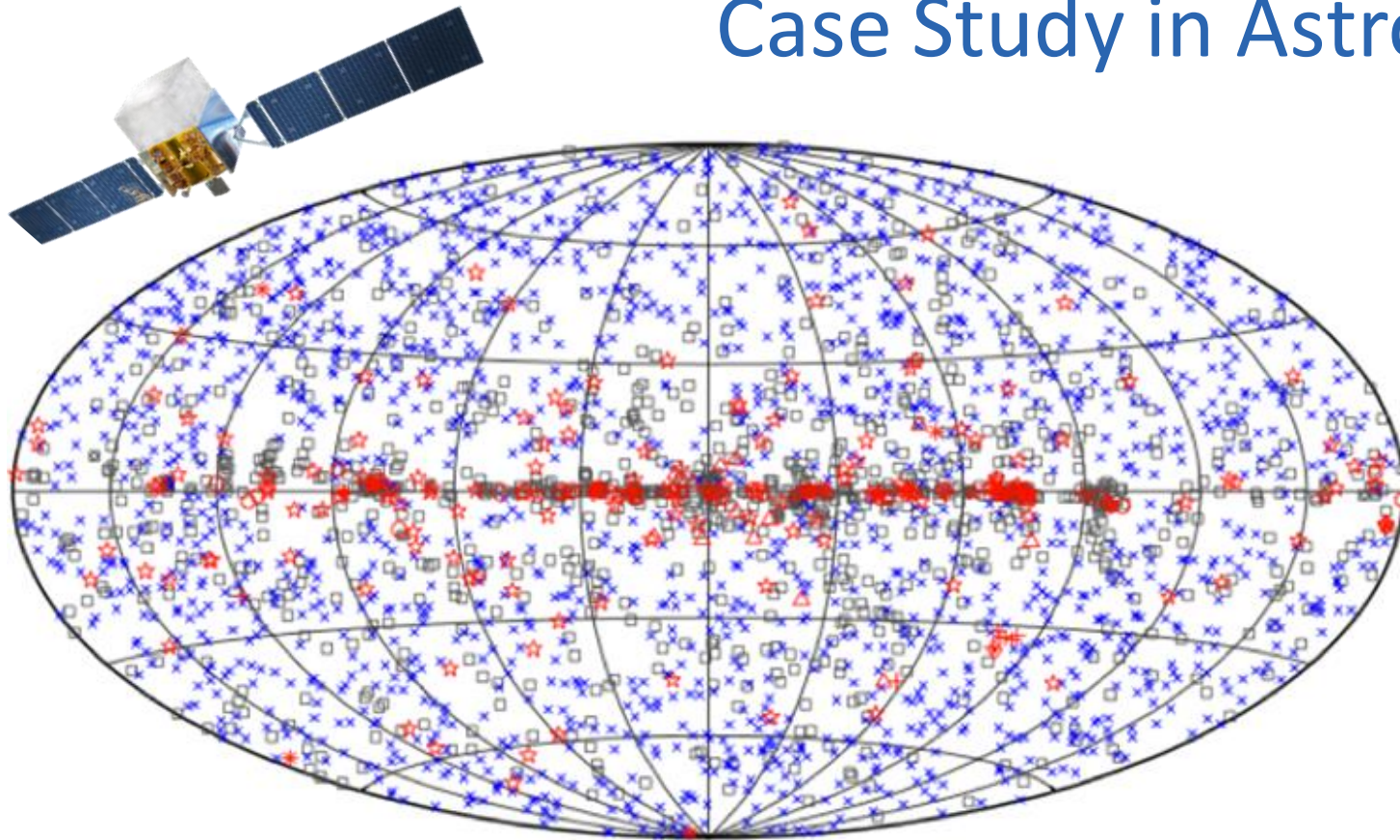
DATASPACE or
Digital Workspace



Cavallo et al. (2019)



Case Study in Astrophysics



□ No association	■ Possible association with SNR or PWN	× AGN
☆ Pulsar	△ Globular cluster	◆ PWN
⊗ Binary	+ Galaxy	○ SNR
● Star-forming region	● Starburst Galaxy	● Nova

4FGL Catalog of Gamma Ray sources

Data Types

Several types of Astrophysical sources with a large fraction of Objects Non Associated with counterparts at other wavelength

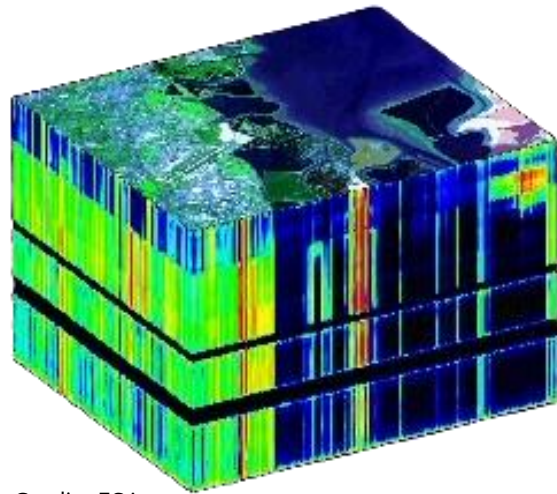
Aim

Multiwavelength characterisation of sources

Study of possible counterparts for Unassociated Sources

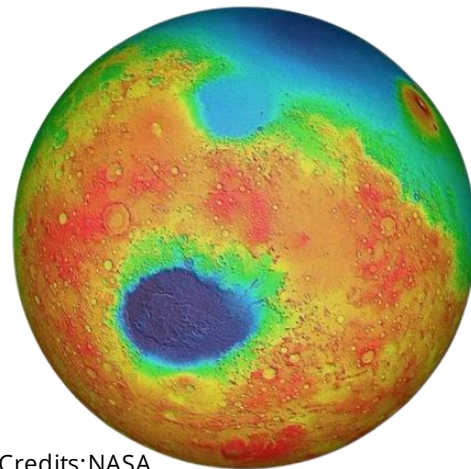
Case Study in Geophysics

Hyperspectral Data
+
Other Spectral Data

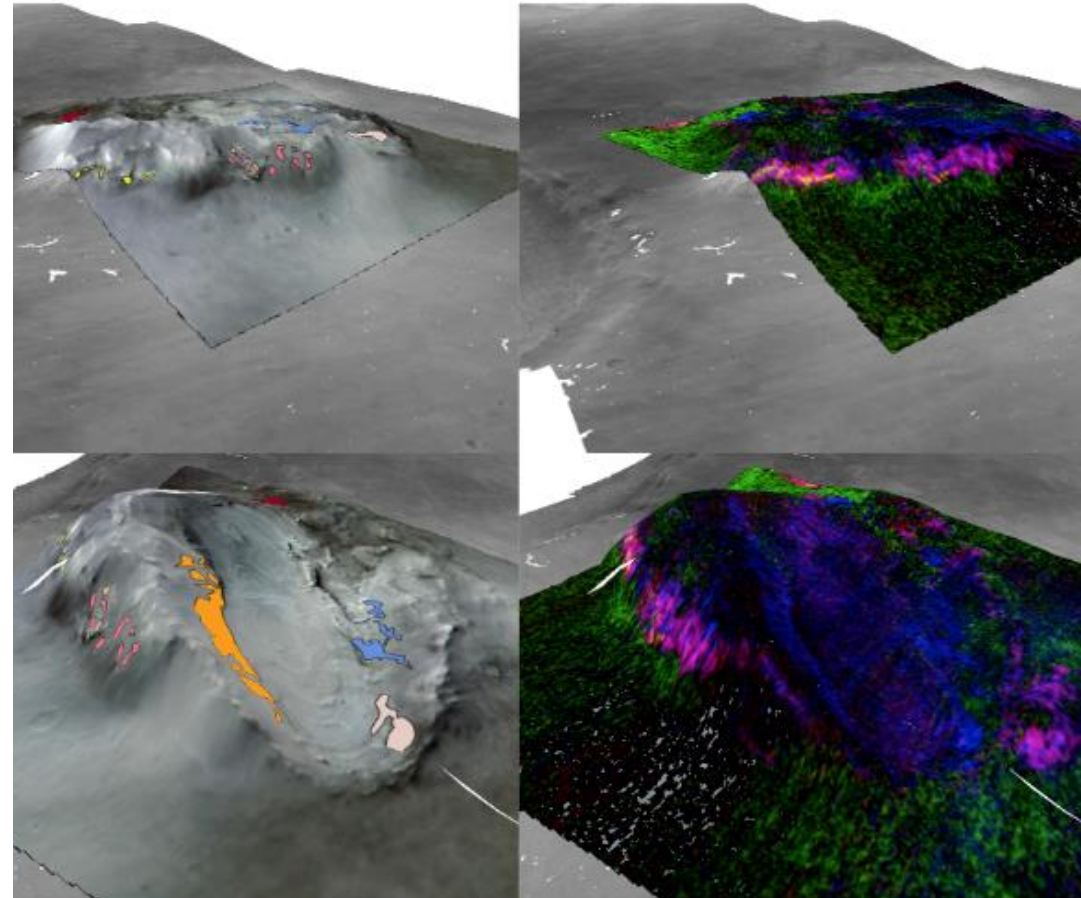


Credits:ESA

Morphological Data



Credits:NASA



Activities

Action A

Staff Recruitment – Hardware Setup and Definition of Data Acquisition, Pre-Processing, Modeling, and Visualization Tools and Physical Space

Action B

Prototyping of Acquisition, Pre-Processing, Modeling, and Visualization Tools

Action C

Case Study in Astrophysics & Case Study in Geophysics

Involved Staff and New Recruitments

Involved Staff

- Prof. Maurizio Petrelli (PA) - PI - Earth Scientists, Data analysis (Management, A, B, C)
- Prof. Diego Perugini (PO) - Earth Scientists, Geophysical Data analysis (A, C)
- Dr. PhD. Stefano Germani (RTD-B) - Physicist, Data analysis (B, C)
- Prof. Sara Palmerini (PA) - Physicist, Data analysis (B, C)
- Prof. Gino Tosti (PA) - Physicist, Astrophysical Data analysis (B, C)
- Prof. Alessandro Rossi (PA) - Physicist, Framework Development (A, B)
- Prof. Francesco Frondini (PA) - Earth Scientists, Data analysis (A, C)
- Prof. Giuseppe Saldi (PA) - Earth Scientists, Data analysis (A, C)

New Recruitments

Data Scientists involved in actions A and B (8-9 months)

Milestones

Milestone 1 – M4: Staff Recruitment (A)

Milestone 2 – M4: Hardware Setup and Definition of Data Acquisition, Pre-Processing, Modeling, and Visualization Tools (A)

Milestone 3 – M8: Prototyping of Acquisition, Pre-Processing, Modeling Tools Completed (B)

Milestone 4 – M12: Prototyping of Visualization Tools Completed (B)

Milestone 5 – M12: Case Study in Astrophysics Completed (C)

Milestone 6 – M12: Case Study in Geophysics Completed (C)

Voce di costo	M1-M4	M5-M8	M9-M12	Totale
Attività A [Milestone 1 at M4 - Milestone 2 at M4]				
Personale Strutturato	49330			49330
Personale Arruolato	28324			28324
Attività B [Milestone 3 at M8 - Milestone 4 at M12]				
Personale Strutturato		24665	24665	49330
Attività C [Milestone 5 at M12 - Milestone 6 at M12]				
Personale Strutturato		24665	24665	49330
Totali costi	77654	49330	49330	176314
Altri costi indiretti (specificare)				
	7400	7400	7400	22199
Totali costi complessivi				198513

Rimodulazione 1							
Personale	Qualifica	Ruolo	UCS	Mesi Uomo	Ore totali	valore	
M Petrelli	PA	PI	48	2	300	14400	
D Perugini	PO	Responsabile Azione 1	73	2	300	21900	
S Germani	RTDB	Pertecipante al progetto	0	0	0	0	
S Palmerini	PA	Responsabile Azione 3	48	3	450	21600	
G Tosti	PA	Pertecipante al progetto	48	3	450	21600	
A Rossi	PA	Responsabile Azione 2	48	3	450	21600	
G Saldi	PA	Pertecipante al progetto	48	2.5	375	18000	
F Frondini	PA	Pertecipante al progetto	48	1.5	225	10800	
Tot						129900	
Costi per servizi di consulenze specialistica							
Idea-Re S.r.l.						49128	
Tot						49128	
Costi indiretti						19485	
TOT PROGETTO						198513	

Rimodulazione 2							
Personale	Qualifica	Ruolo	UCS	Mesi Uomo	Ore totali	valore	
M Petrelli	PA	PI	48	2.4	360	17280	
D Perugini	PO	Responsabile Azione 1	73	2.4	360	26280	
S Germani	RTDB	Pertecipante al progetto	0	0	0	0	
S Palmerini	PA	Responsabile Azione 3	48	3.5	525	25200	
G Tosti	PA	Pertecipante al progetto	48	3.5	525	25200	
A Rossi	PA	Responsabile Azione 2	48	3.5	525	25200	
G Saldi	PA	Pertecipante al progetto	48	2.5	375	18000	
F Frondini	PA	Pertecipante al progetto	48	1.5	225	10800	
Tot						147960	
Arruolamento Personale a Contratto							
Borsa di Ricerca 8-9 Mesi						28359	
Tot						28359	
Costi indiretti						22194	
TOT PROGETTO						198513	



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Thank You!

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