

## Purpose of WG4 [from memorandum]:

This group studies the potential applications of RV to important application areas beyond software and hardware reliability, including medical devices and legal contracts. This task requires the direct interaction with experts from the respective communities. **The Working Group will organize workshops with invited experts from application domains.** For example, for the safe interoperability of medical devices, it is important to enrich the interface COST specifications with temporal properties about the intended interaction of two devices and to synthesize monitoring code for runtime. If monitoring identifies unwanted behavior, the systems might go into some fail-safe mode. Another interesting application area that will be explored is how to monitor legal e-contracts (e.g., computer-mediated transactions). Some efforts have recently been done to formalize legal contracts using formal languages, where skeletons of runtime monitors could be extracted from the formal semantics. The time is now right to apply these techniques successfully to real case studies, which is planned for this working group. Other applications include robotic and hybrid systems, monitoring for business models and systems security.

- **Concrete output of this Working Group will consist of documents describing challenges and potential applications of runtime verification to these application areas.**
- **Moreover, a concrete case study in the medical domain will be performed identifying the safety enhancements of medical devices by using runtime verification techniques.**

## Deliverables based on memorandum

Item	Description	Status
Case study database	A case study database being built online	Online at: <a href="https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Previous_case_studies">https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Previous_case_studies</a>
Report: Classification of RV applications	A high-level overview of RV applications and how they can be classified under subheadings	Online at: <a href="https://docs.google.com/document/d/1jSoOycgsbXhre2eTglPfEDjXaXHgpbikSMbErm3JzBY/edit?usp=sharing">https://docs.google.com/document/d/1jSoOycgsbXhre2eTglPfEDjXaXHgpbikSMbErm3JzBY/edit?usp=sharing</a>
Report: RV in industry	An overview of the past experiences, lessons learned and a way forward for RV in industry	Online at: <a href="https://docs.google.com/document/d/1wXStv_Nid08xdRDGiapPWff-nrGmZJoVD2OWElhF2LU/edit?usp=sharing">https://docs.google.com/document/d/1wXStv_Nid08xdRDGiapPWff-nrGmZJoVD2OWElhF2LU/edit?usp=sharing</a>
Summer School	Helped in organising summer school adding the practical	<a href="https://rv2016.imag.fr/?page_id=128">https://rv2016.imag.fr/?page_id=128</a>

	aspect	
Case study in the medical domain	Concrete case study in the medical domain will be performed identifying the safety enhancements of medical devices by using runtime verification techniques	Subchairs for medical devices: Martin, Ezio. A case study is well underway.
Workshops	See below	

## Past and future WG4 activities

Meeting	Description	Outcome
Malta, Apr 2015	Workshop on RV & Financial Transactions	<a href="https://www.cost-arvi.eu/?page_id=166">https://www.cost-arvi.eu/?page_id=166</a>
Vienna, Sep 2015	Progress update	<a href="https://docs.google.com/presentation/d/10fM3nOPkKr8CXnY1659xPRhV3GaKYZ8hvGmX7B2Hhgo/edit#slide=id.gc93b8c1d3_0_0">https://docs.google.com/presentation/d/10fM3nOPkKr8CXnY1659xPRhV3GaKYZ8hvGmX7B2Hhgo/edit#slide=id.gc93b8c1d3_0_0</a>
Tallinn, Dec 2015	Talks and Discussion	<a href="https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Meeting_3">https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Meeting_3</a>
Vienna, April 2016	Workshop on Medical Cyber Physical Systems	<a href="http://mlab-upenn.github.io/medcps_workshop/">http://mlab-upenn.github.io/medcps_workshop/</a>
Madrid, Sep 2016	Talks	<a href="https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Meeting_in_Madrid?parent=WG4_%E2%80%93_Application_areas">https://redmine.isp.uni-luebeck.de/projects/caic1402arvi/wiki/Meeting_in_Madrid?parent=WG4_%E2%80%93_Application_areas</a>
Prague, Mar 2017	Workshop on contracts	<a href="https://www.cost-arvi.eu/?page_id=862">https://www.cost-arvi.eu/?page_id=862</a>
2017/18	Workshop on Systems Security	
???????	Workshop on .... <b>Other applications include robotic and hybrid systems, monitoring for business models</b>	