SLPforBMS - Service Life Prediction for a risk-based Building Management System (PTDC/ECM-COM/5772/2014, 2016-2019)

Partners: CERIS/IST

Principal Investigator**:** J. de Brito

CERIS Research Team: A. Silva, C. Pereira, I. **Flores-Colen** (15%), J. D. Silvestre, P. L. Gaspar; R. Neves; J. Dias.

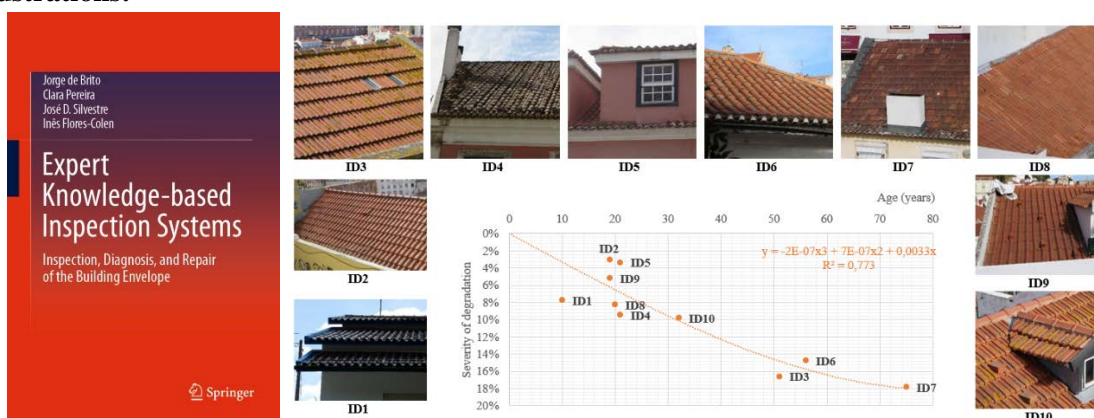Funding**:** FCT   Total budget: 170.023€   CERIS: 170.023€

Period: 01/06/**2016**-30/11/**2019**   http://slpforbms.tecnico.ulisboa.pt/

Summary description: this research project intended to develop a building management system of building envelope's elements (flat and pitched roofs, walls - ceramic, renderings, painted surfaces, natural stone, ETICS and architectural concrete), in current buildings, including inspection and diagnosis, service life prediction procedures and support decision-making processes in the maintenance/rehabilitation area. The buildings overall performance is intrinsically related to the performance of their components and, in particular to the external envelope that acts as the "skin" of the building, protecting it from the degradation agents.

Output: the project developed an inspection and diagnosis system based on the normalized classification lists of defects, causes, inspection methods and repair techniques. These systems were validated through extensive fieldwork for data collection, using visual inspections and for evaluation the degradation condition of the buildings elements. The data related to building envelope's pathology must be converted to an overall degradation index that depicts the global performance of any construction element. Based on this index, different methodologies for service life prediction are proposed, allowing a more reliable decision-making process in maintenance scheduling.

Illustrations:

Indicators: 43 articles published; 2 national papers; 18 papers in international conferences; one ongoing PhD Thesis - Clara Pereira with FCT scholarship - SFRH/BD/131113/2017; 5 MSc dissertations; 25 research reports.

SLPforBMS - Service Life Prediction for a risk-based Building Management System (PTDC/ECM-COM/5772/2014)

1. Pereira, C.; Silva A.; de Brito, J.; Silvestre, J.; **Flores-Colen,** I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of the criteria for defining indexes of correlation between anomalies and causes" (in portuguese). CERIS-ICIST DTC 24/**2016** report, Task 1.3, October 2016, IST.

2. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of the criteria for the classification of diagnostic methods and definition of correlation indexes with anomalies" (in Portuguese). CERIS-ICIST DTC 27/**2016** report, Task 1.4, November 2016, IST.

3. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of the criteria for the classification of repair techniques and definition of correlation indexes with anomalies" (in Portuguese), CERIS-ICIST DTC 28/**2016** report, Task 1.5, December 2016.

4. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of anomaly sheets" (in Portuguese), CERIS-ICIST DTC 01/**2017** report, Task 1.6, March 2017.

5. Pereira, C.; Silva A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I. "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of the diagnostic method sheets" (in portuguese), CERIS-ICIST DTC 02/**2017** report, Task 1.7, March 2017.

6. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of repair techniques sheets" (in Portuguese), CERIS-ICIST DTC 07/**2017** report, Task 1.8, April 2017.

7. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Homogenization of inspection sheets" (in portuguese), CERIS-ICIST DTC 08/**2017** report, Task 1.9, May 2017.

8. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Creation of an atlas of anomalies" (in portuguese), CERIS-ICIST DTC 13/**2017 r**eport, Task 1.10, August 2017.

9. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings" (in Portuguese), CERIS-ICIST DTC 16/**2017** report, Task 1.11, November 2017.

10. Pereira, C.; Silva, A.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Incorporation of vinyl and linoleum floor coverings in the global inspection system" (in portuguese", CERIS-ICIST DTC 08/**2018** report, Task 1.12, July 2018.

11. Pereira, C.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I.: "Systematization of data acquisition methods related to the pathology of the buildings' surroundings. Incorporation of vinyl and linoleum floor coverings in the global inspection system" (in Portuguese), CERIS-ICIST DTC 09/**2018** report, Task 6.1, July 2018.

12. Pereira, C.; de Brito, J.; Silvestre, J.; **Flores-Colen**, I. "Dissemination of the project and its deliverables. Glossary of terms used in classification systems" (in Portuguese), CERIS-ICIST DTC 13/**2018** report, Task 6.2, August 2018.