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CHALLENGES FOR THE THIRD MILLENNIUM

Making easier the Teaching - Learning Process of OpenSees and its use in Practice and Research

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ABSTRACT

This article describes the integration of an advanced calculation engine developed mainly for researchers (OpenSees) into a practice-oriented computer tool (StruBIM) making it accessible for educational purposes; teaching, research and practice are linked in this way. OpenSees is a well-known open-source framework to perform linear and non-linear analysis, developed at University of California, Berkeley. Its use is widespread all over the world and allows users to simulate efficiently the response of complex structural and geotechnical systems subjected to earthquakes and other hazards. However, OpenSees is script-based and lacks of a user-friendly guided environment. For this reason, it was little used in practice and in research despite its high computational capacity. Cype S.A. has bridged this gap and has integrated OpenSees as calculation engine in its new suite StruBIM for analyzing and designing structures. StruBIM has a user-friendly interface, permits interactive view of the model, guides the calculation process and offers an intuitive post-processor of results. The outcomes of this integration are: (1) it is much easier to teach and learn how to use OpenSees: its scope of application, its functionality and the resolution of educational practical cases with it. Bearing in mind the current requirements of the European society, a practical approach using a powerful and widespread tool valid for practical and research work is needed for learners. (2) It makes OpenSees an attractive tool for civil engineers and architects to be used in practice and to solve complex actual cases. (3) Analogously, Cype is currently working on extending StruBIM to benefit from all functionality of OpenSees applied to research world. Therefore, this experience shows the benefits of linking the teaching-research-practice process: the teaching-learning process is much easier to achieve and practice and research are able to use the functionality and the high performance of OpenSees.