

## Interview with Dr Dengwu Jiao, 2025 RILEM Colonnetti medallist

Dr Dengwu Jiao is an Assistant Professor in the Department of Architecture and Civil Engineering at City University of Hong Kong (Hong Kong, China). He received his Master of Engineering from China Building Materials Academy (Beijing, China) in June 2017, and obtained the degree of Doctor of Civil Engineering from Ghent University (Belgium) in January 2021. He also received the Doctoral Degree in Engineering from Hunan University (China) in April 2021. Dr Jiao has been a RILEM member since 2020. Dr Jiao has focused his research on controlling the rheology of cement-based materials, including the use of magnetic fields, to design optimized mixtures for 3D concrete printing. In 2025, he was awarded the RILEM Gustavo Colonnetti medal for the quality and impact of his research.



20 February 2025

\*\*\*

**Daniela Ciancio, RILEM Implementation Manager (RIM):** Good afternoon Dengwu, and thank you for your time today!

**Dr Dengwu Jiao (Dengwu):** Good morning to you!

**RIM:** If I am correct, you are 32 years old.

**Dengwu:** That's correct. I was born in August 1992.

**RIM:** Many of the last medallists I interviewed told me "*this was my last chance to apply for the medal*". In your case, you still had some years before becoming not eligible (*Editor's note: The Gustavo Colonnetti medals are awarded to researchers under 35 years*)! How does it feel?

**Dengwu:** It's an incredible honour for me to receive this prestigious medal.

**RIM:** Was it the first time that you applied for it?

**Dengwu:** Actually, no. This was my third attempt. My first try was in 2022, when I was a postdoc at Ghent University.

**RIM:** I read you became a RILEM member in 2020, when you were a PhD student at Ghent University. Was that the first time you were exposed to RILEM and its activities?

**Dengwu:** Not exactly. I was already familiar with RILEM during my PhD studies at Hunan University in China. At that time, I attended several international conferences held in

China and co-sponsored by RILEM, such as the [2<sup>nd</sup> International Conference on UHPC Materials and Structures \(UHPC2018\)](#), in Fuzhou, and the [Fourth International Symposium on Design, Performance and Use of Self-Consolidating Concrete \(SCC'2018\)](#), in Changsha. I have a few papers published in the Proceedings of these events. Later, when I moved to Europe, I attended the [9th International RILEM Symposium on Self Compacting Concrete \(SCC9\) & 2nd International RILEM Conference on Rheology and Processing of Construction Materials \(RheoCon2\)](#), in Dresden, Germany, in 2019. I officially joined RILEM in 2020 because Ghent University is a Corporate Member.

**RIM:** Can you tell us more about your double PhD?

**Dengwu:** Certainly. After completing my master's degree at the China Building Material Academy in Beijing, I started my PhD at Hunan University. My supervisor, Prof. Caijun Shi, encouraged me to collaborate with Prof. Geert De Schutter at Ghent University. Therefore, after finishing my coursework in Hunan and obtaining a visa to Belgium, I moved to Ghent University to start my research. All the research work for my doctoral thesis was actually conducted in Ghent, supported by a full scholarship from Ghent University through the European Research Council (ERC) Advanced Grant "[SmartCast](#)" Project.

**RIM:** So... you moved from Beijing to Hunan, then to Ghent and then back to China, as you're now based in Hong Kong.

**Dengwu:** Yes, I've lived in many cities like Beijing, Changsha, Ghent, and now Hong Kong. I would like to say that Ghent is very peaceful and perfect for a relaxed lifestyle. Everyone there seems to be calm. In contrast, life in China is very competitive, especially in Hong Kong. It's densely populated and often feels quite crowded.

**RIM:** Talking about being competitive and busy, I had a look at your list of publications... you have published a lot! And you are supervising many Master and PhD students. Are you going to invite them to join RILEM?

**Dengwu:** Absolutely! I've already encouraged my students and research assistants in my group to become RILEM Young Members. In fact, some of them have submitted abstracts to the [1<sup>st</sup> RILEM Youth Council Symposium](#), which will take place this October.

**RIM:** Let's talk now about your keynote lecture at the RILEM Gustavo Colonnetti award ceremony of the [2025 Spring Convention](#) in Mendrisio, Switzerland, this coming March. What are you going to present?

**Dengwu:** I will discuss the rheology control of cementitious materials. To make the topic comprehensible to a non-specialist audience, I plan to start with a basic introduction to "rheology" and explain why it is so important for concrete. For example, rheology governs the plasticity and workability of concrete, while the rheological requirements can vary significantly for the same batch in different placing processes, like transporting, pumping, casting, etc.

**RIM:** So, your research focuses on how to guarantee that the adequate requirements are met?

**Dengwu:** Not exactly, it's broader than that. My research can be divided into two main parts. The first part is understanding the basic rheological behaviour under the influence of different factors, such as changes in raw materials or mix proportions, and then use this knowledge to optimize the mixture design for high-performance concrete. The second part of my research focuses on actively controlling the rheology of concrete using external signals.

**RIM:** I saw your research on magnetic fields. Are you talking about that?

**Dengwu:** Yes! My research is mainly focused on using a magnetic field as a trigger signal. By applying a magnetic field, we can achieve on-demand control of concrete rheology. My work is mainly aimed at understanding the underlying mechanisms, the influencing factors, the potential applications, and also the effects of this control on the hardened properties of concrete, like its microstructure and strength.

**RIM:** How far is this technology from being implemented on construction sites?

**Dengwu:** Well, this concept is relatively new. It was first proposed no more than 10 years ago, by Prof. Geert De Schutter, who initiated the fundamental studies under the European Research Council (ERC) Advanced Grant "[SmartCast](#)" Project. Today, it has become an active research topic within RILEM TC [317-ACP Active Control of Properties of Fresh and Hardening Cementitious Materials](#). I am a member of this TC and I contributed as a chapter leader of the upcoming State-of-the-art (STAR) report. Hopefully, in the near future, we can develop practical methods for real-world applications, such as controlling the rheology during concrete pumping from a truck.

**RIM:** Wow! That would be fantastic. Thank you for sharing a preview of your presentation with us.

**Dengwu:** Thank you for providing the opportunity of this interview! I look forward to seeing you all in Mendrisio, Switzerland!