The scholarship granted by FISITA allowed me to go on a three-month research programme at the Istituto Motori (IM) in the city of Naples, Italy, where I was tutored by PhD researchers Simona Merola and Adrian Irimescu.

IM is a public multidiscipline research centre of the National Research Council of Italy, with more than 70 years of history in fundamental and applied research in the field of engines for powertrains and energy production. The mission of Istituto Motori is twofold: directed towards the continuous deepening of knowledge of key chemical and physical processes underlying energy conversion and focused on development and innovation. The latter is a recurring objective that can be reached by developing research methodologies as an alternative to conventional methodologies and contributing to the development of original technologies leading to industrialisation.

In this research stage, a four-stroke direct injection spark ignition engine with optical access was used. With a large quantity of measuring instruments installed in the engine, it is possible to carry out traditional thermodynamic studies and correlate it with real-time images of combustion. For this project, various liquid fuels (traditional and alternatives) were studied, focusing on the fundamental study of combustion when the injection strategy is changed.

I have exploited the background and technical expertise built during my master’s degree at Technological Institute of Aeronautics (ITA) of Sao José dos Campos in Brazil. In ITA, I performed some tests on a SI optically accessible engine fuelled with syngas. Therefore, the scholarship granted by FISITA gave me the opportunity to improve my competences and establish an effective cooperative research agreement between two institutions in South America and Europe.
In addition to the great scientific contribution and knowledge on internal combustion engines, this scholarship allowed me to learn about the culture and places of southern Italy – and even learn a new language. Through the exchange of opinions and life experiences with students and researchers of Istituto Motori, I improved my educational and personnel skills. At the same time, the experience in IM allowed me a soft integration into a different culture allowing me to taste different foods.

Naples is the regional capital of Campania and the third-largest municipality in Italy after Rome and Milan (centre and north of Italy, respectively). Around 1 million people live within the city’s administrative limits, while its province-level municipality has a population of 3 million residents. In general, Neapolitan people are friendly and were welcoming and inclusive to me. Football, food and coffee are the centre of everyday life. With its vast coastline, Napoli has several maritime attractions that make the place a paradise in the spring and summer months. Islands such as Capri, Procida and Ischia are some of the places that I had the opportunity to visit. In the centre of the city it is possible to find various tourist traps such as castles, a historical underground city and different museums. In addition, all the province of Naples is a magical place where colours, flavours, culture and history are intertwined in a charming mix of knowledge, joy and fun. I highlight two places: the Sorrento Bay to the south and the magnificent area of Phlegraean Fields to the north. In the centre of this arc lies Naples with the majestic Vesuvius directly behind it.

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