PRESS RELEASE

FOR THE FIRST TIME IN THE WORLD
CARDIOLOGISTS IN TURIN EXPLOIT ARTIFICIAL INTELLIGENCE
TO DEFINE THE POST HEART ATTACK STRATEGY

A study by the University Cardiology Department of the "Città della Salute" (Turin's Health and Science Centre), carried out with researchers from UniTo and PoliTo, to create a new system for classifying the risk of future events in patients after a heart attack, has been published in the journal The Lancet. *A technique that will bring about a veritable revolution and statistically reduce the possibility of an incorrect diagnosis. This result reinforces the choice of Turin as the headquarters of the Italian Institute for Artificial Intelligence*

Turin, January 15th 2021 - The extraordinary result of research coordinated by the **University Cardiology Department** of the Molinette Hospital of the **Città della Salute of Turin** (directed by Professor **Gaetano Maria De Ferrari**), together with the **Department of Computer Science** of the **University of Turin** and the Department of **Mechanics and Aerospace** of the **Politecnico di Torino**. The authors used the Artificial Intelligence approach called Machine Learning, according to which computers learn progressively from the data they are given, progressively improving their predictive capabilities and identifying correlations. In this case, **the result was the creation of a new classification system for the risk of future events in post heart attack patients. The absolute novelty and great effectiveness of this new approach earned the research project publication, today 15 January, in the world's most renowned medical journal, *The Lancet*.**

"*Patients with acute myocardial infarction* – explains Dr. **Fabrizio D'Ascenzo**, study coordinator – *are at very high risk of both a recurrence of a heart attack, as well as major bleeding related to drugs that keep the blood 'more fluid', such as cardioaspirin, in the first two years. The decision on the best therapy must balance these two risks, which the cardiologist does based on his/her experience and clinical intuition, aided by risk scores. Nevertheless, these scores are not very precise and therefore of little help, even for an experienced cardiologist. We therefore sought to improve the situation using clinical data on 23,000 patients, much of which was collected in Piedmont, which provided the critical mass of information for our research*".

"*We have been collaborating for years with the Molinette University Cardiology Department, studying the relationship between blood flow and arterial diseases* – say Professors **Umberto Morbiducci** and ***Marco Deriu*** of the Computational Biomechanics Group of the Politecnico – *and as Bioengineers we are thrilled to have extended the collaboration to this new, extremely promising field*".

Data analysis using this AI-based technique differs markedly from the approach used so far based on traditional statistical analysis. In certain fields, **this new technique will bring about a veritable revolution**.

"*The data* – explains **Marco Aldinucci**, Professor of Computer Science at UniTo – *was analysed with Machine Learning algorithms that use mathematical-computational methods to learn information directly from the data, without the need to know anything in advance about the possible relationships among such data".*

The difference found between the previous approach based on traditional statistical analysis and this one, based on Artificial Intelligence, was really important. While the accuracy of the best available scores for identifying the possibility of an event such as a new heart attack or bleeding is around 70%, **the accuracy of this new risk score is close to 90%, statistically reducing the possibility of an incorrect diagnosis from three to only one out of every ten patients analysed.**

"*We are thrilled about these results* - affirms Professor **Gaetano Maria De Ferrari** – *for three reasons*. *Firstly, we can now better treat our patients, adding truly precise estimates of the risk they face to our clinical experience, confirming the central role of the Turin University Cardiology Department in research aimed at creating benefits for patients. Secondly, the study is a very strong demonstration of the possibilities of Artificial Intelligence in medicine and cardiology in particular. Thirdly,* ***this result, obtained in collaboration between the University and the Politecnico, reinforces the choice of Turin as the headquarters of the Italian Institute for Artificial Intelligence.*** *In particular,* ***we would like to be a candidate for an Italian role of reference for artificial intelligence in medicine*** *and this publication can help legitimise this aspiration".*

Turin was chosen as the headquarters of the Italian Institute for Artificial Intelligence (*3I4*AI), which will address the application of artificial intelligence in various sectors, with research activities also planned in several additional locations throughout the country.

Both the University and the Politecnico di Torino will play an important role in the Institute. "*We welcome with satisfaction and pride the news of this extraordinary success which, once again, demonstrates the value of our research* – says the **Rector of the University of Turin, Stefano Geuna** – *The attention of the global scientific community to this study confirms the University of Turin as a national research excellence at the international level. The research teams involved, to which we extend our heartfelt thanks, have shown how extraordinary results can be achieved by sharing ambitious objectives and integrating knowledge and skills. The new scientific frontier that combines the application of artificial intelligence with diagnostics in medicine is able to improve, as never before, the treatment of major diseases and, more generally, the quality of life of many people affected by severely disabling diseases. In order to achieve these results, we can count on research capable of integrating technological innovation and highly specialised knowledge. The universities of Turin and our health system now share a proven experience in this direction. This makes Turin the ideal location to host the Italian Institute for Artificial Intelligence*".

"*This project further objectifies the strong partnership between the University and the Hospitals, where research and care are integrated to ensure increasingly technological innovative processes, with the common goal of ensuring patients the best care*", underlines **Giovanni La Valle, General Director of the Città della Salute of Turin**.

"*Artificial Intelligence is a key topic for research in the coming years, on which our University can boast skills recognised by the international scientific community, and has achieved results of great importance, such as coordination of the National Doctorate on Artificial Intelligence, on AI and Industry 4.0 and participation of the Politecnico in the prestigious ELLIS, European Laboratory on the Artificial Intelligence of data* – says the **Rector of the Politecnico di Torino, Guido Saracco** - *The excellent result produced by this research conducted in collaboration with the University of Turin and the Città della Salute demonstrates once again the multiplicity and cross-sectional nature of applications of Artificial Intelligence, which now spans all the leading sectors of our economy, including automotive, manufacturing, the luxury industry and many other areas, such as health, where it is becoming increasingly essential. This research is also an example of multidisciplinary collaboration between institutions, which demonstrates once again that all the players in the area are ready to work together to make the Institute a great research centre*".

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