

# Perugian professor with her eye on hidden variables

**Elena Stanghellini is Professor of Statistics at the University of Perugia – but also, at least since 2008, a familiar face at USBE and its Department of Statistics. She visits Umeå a couple of times a year in her capacity as lecturer, guest researcher and student supervisor.**

**“Perugia and Umeå have a lot to learn from each other. I hope we can set up an exchange between students and researchers at the two institutions this year,” she says.**

**E**lena’s story of how she ended up in Umeå shows just how international the world of academia is today. At a 2005 conference in North Carolina, USA she fell into conversation with Xavier de Luna, Professor of Statistics at USBE. It turned out they were in similar fields of research and this eventually led to Elena being invited to examine a doctoral thesis in Umeå.

“I clearly remember the first time I flew to Umeå from Stockholm,” laughs Elena. “I just saw water and forest everywhere outside the window and wondered what I’d got myself into and whether I was on my way to the ends of the earth. But I quickly felt right at home. I received a warm welcome and was inspired by all the activity in my field.”

## **Dreams about Umeå**

Since 2008, Elena has come to Umeå a few times a year, usually for two or three weeks. When we talk to her she is in Perugia, but tells us that she dreamt about Umeå the night before the interview.

“It’s become my second home and I hope to return soon, probably in the autumn. On my last visit I got to make candles for the first time

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in my life, which was very interesting.”

Elena has built up a wide circle of friends in Umeå over just a few years. When she is here, she socialises a lot with them, but also likes cycling (in the summer), going to the cinema and attending NorrlandsOperan’s performances and concerts.

“I’m amazed by the lack of traffic in Umeå. I can cycle on the road with the cars and cross the street without risking being run over. It’s not like that in Perugia.”

### Italy versus Sweden

With her insight into academic life in Perugia and Umeå, Elena believes both can learn from each other. She describes Umeå University as more structured than Perugia, with the teaching focused more on the students going on to become researchers. She also thinks that the students are a more homogeneous group in Sweden. It’s easy to understand which background they are from and what level they are at when they begin university. In Italy there is much greater variation in the students’ level of understanding, which requires more work on the part of a lecturer. Elena believes that teaching has a greater emphasis in Perugia than in Umeå.

“Generally speaking, the students in Italy are a little more undisciplined and extrovert, and lectures can be a bit livelier in Perugia than in Umeå.”

Elena is working with colleagues in Umeå to set up an exchange between the two universities, with the first step possible this year through the EU-funded Erasmus programme.

“Sharing experiences and collaborating would benefit everyone, not least the students. In today’s globalised world, it’s more important than ever to be comfortable moving in international circles from an early stage.”

### Teaching more and more

Elena obtained her doctorate in 1995 and was entirely focused on research during the first few years of her academic career. However, over time she has started doing more teaching, including on her visits to Umeå, where she is a popular lecturer.

“I just love teaching. The interaction with the students is rewarding and worthwhile. I learn a lot from the way they behave. And getting to shape a new generation of statisticians feels both exciting and meaningful.”

On the question of what she is most proud



“Umeå has become a second home to me,” says Elena Stanghellini, Professor of Statistics at the University of Perugia.





Elena Stanghellini loves going to NorrlandsOperan when she's in Umeå. This picture is from a performance of La Bohème.

of so far in her years as a statistician, she replies:

“I’ve certainly come up with some results that are original and interesting, but I’d prefer to be able to say that I’ve influenced many people, opened their eyes, got them to realise how important statistics are in understanding our modern world. That’s what I’d like to achieve through my teaching.”

### Homelessness and sustainability

Elena has produced a prodigious amount of research since 1995, with her main focus on applied statistics. Much of her research is based on graphic Markov models and how they can be used. These models are employed to determine the probability of future actions based on previous actions - for example, the probability that I will eat a particular meal tomorrow based on what I ate today. Over the years, the models have been applied in both social science and economic research.

Elena’s own twist on these models is the matter of hidden variables, or how the models account for information not apparent in the underlying data.

“Recently, these have been used in trying to estimate how many homeless people there are in Italy. There are more than the statistics

show, and research using my methods takes account of this latent factor.”

Between 2010 and 2012, Elena was involved in the major international research project SIRP (Sustainable Investment Research Platform), which included researchers from a range of different disciplines. As part of SIRP, Elena published a report titled ‘How to measure sustainability?’, in which she shows how statistics can be used to help measure how sustainably - in both social and environmental terms - a company is operating.

“Measuring sustainability is highly complex, with so many factors to take into account, and the research is still in its infancy. We don’t yet know which statistical model is most reliable. It may be that we have to combine different models.” ■