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### Wheeler Ruml, Assistant Professor of Computer Science, travels to Ireland

Wheeler Ruml

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## Wheeler Ruml

### Assistant Professor of Computer Science - College of Engineering and Physical Sciences

*Professor Wheeler Ruml traveled to Ireland in June to establish a collaborative relationship with a research group at the Cork Constraint Computation Center.*



Kevin Rose & Wheeler Ruml in Kinsale, County Cork, Ireland

As part of the research for his senior honors thesis, rising UNH senior Kevin Rose spent the summer of 2009 on a UNH International Research Opportunities Program (IROP) grant at one of the foremost labs for discrete optimization in the world, the Cork Constraint Computation Centre in Ireland (also known as 4C). Thanks in part to a Faculty International Development Grant from the UNH Center for International Education, I was able to travel to 4C to spend the first week of Kevin's IROP with him, helping him settle in and building a collaboration with the group at Cork around our shared interest in computer systems that use their experience in solving problems to learn how to solve problems better in the future. There is a strong history in the Cork group on learning from past problem-solving episodes, and we are exploring the productive interplay between those techniques and my work on learning during problem-solving itself.

While modern computers may seem to be fast enough for everyday web browsing, the dirty little secret of computer science is that there are many important problems for which current methods would take literally thousands of years to compute a solution. Even worse, for some types of problems the solving time can vary anywhere between a fraction of a second and thousands of years, and there is no way to know whether the problem at hand will be solved quickly or slowly without trying it! For anyone who wants to build a practical system, this is intolerable. The work that Kevin and I are pursuing in collaboration with the Cork group is aimed at understanding some of the reasons for this wide variation and developing methods that are responsive to those factors during problem-solving. Kevin's work will culminate in his senior honors thesis this spring and it will also inform the efforts of one of my graduate students, who is working on a closely-related project.

I had never been outside of an airport in Ireland before, so the opportunity to visit the 4C lab in person and to see a bit of the country was wonderful. While Cork is the second-largest city in the Republic of Ireland, the city proper is quite small and easily traversed by foot. Pastures with sheep directly abut the international airport, which is only about 10 minutes from the center of town. 4C is part of University College Cork, where George Boole, the father of the "boolean logic" that underlies modern computers, taught in the mid-nineteenth century. 4C has about three times as many people working in its specific subarea as UNH has in all of computer science, and it was great to see at one place and time the people whom I usually get to see only in brief glimpses at conferences. There is already a link between 4C and UNH - the director, Gene Freuder, was a professor at UNH for many years. Thanks to the support of CIE and IROP, we have started to build a new and fruitful research collaboration.



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