

Visit Report for Prof. Darrell Whitley
January 12 to January 25
Stirling University, Aberdeen University and Napier University

This trip allowed for three kinds of engagement.

First, it was an opportunity to discuss the current state of the art in the field of Evolutionary Computation and to discuss where the field is going. In general, the UK is one of the leading countries in the world in the field of Evolutionary Computation. Prof. Whitley gave a talk on his current research at the University of Stirling, where he also held a number of fruitful one-to-one meetings with researchers and academic staff. There was also a workshop at Napier University on January 22 on real-world applications of Evolutionary Computation, attended by approximate 25 researchers from at least 3 different Universities. Industry was also represent at the meeting. Prof. Whitley gave a one hour talk at the workshop, which was followed by approximately 3 hours of discussion. There was a focus on industrial applications and the degree to which current theory supports (or does not support) the development of applications.

Second, Prof. Whitley has developed new methods for generating high quality solutions to classic NP-Hard problems. This includes the “Traveling Salesrep Problem” (which is used in routing and scheduling applications) and pseudo-Boolean problems such as Satisfiability (which is used in hardware and software verification). These new methods remove much of the randomness that has been a key feature of Evolutionary Algorithms for the last 40 years. In some cases, it can be proven this randomness is not needed and instead can be replaced by fast, deterministic methods that also have associated quality guarantees. This is radically different way of developing new Evolutionary Algorithms.

Third, this was an opportunity to lay a foundation for future research collaborations. Prof. Whitley already has joint publications with Dr. Gabriela Ochoa at Stirling University. This trip allowed this work to advance. Plans for new research were also developed and are moving forward. Opportunities were also discussed for starting new research in collaboration with Prof. John McCall at the University of Aberdeen.

Overall, it was a highly productive trip.