

Highlights from the University of Bristol, UK

Energy Aware COmputing (EACO) at the University of Bristol is a strategic research theme that brings together researchers across the system stack from hardware to application software and algorithms. Research activity in EACO includes:

- the development of energy monitoring hardware (<http://groundelectronics.com/products/mageec-energy-measurement-kit>)
- the development of a software API to monitor the energy consumption of code at runtime (<https://github.com/eacof>) published as H. Field, G. Anderson and K. Eder. "EACOF: A Framework for Providing Energy Transparency to enable Energy-Aware Software Development". 29th ACM Symposium On Applied Computing. pp. 1194–1199. March 2014, ACM, and accessible at <http://dl.acm.org/citation.cfm?id=2554850.2554920>.
- advanced energy modeling for embedded hardware platforms as used in the ENTRA project published as S. Kerrison and K. Eder. 2015. "Energy Modeling of Software for a Hardware Multithreaded Embedded Microprocessor". ACM Trans. Embed. Comput. Syst. 14, 3, Article 56 (April 2015), 25 pages, and accessible via DOI=10.1145/2700104 or <http://doi.acm.org/10.1145/2700104>
- energy efficient compilation as published as J. Pallister, K. Eder, S. Hollis. "Optimizing the flash-RAM energy trade-off in deeply embedded systems". In Proceedings of the 13th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO '15). IEEE Computer Society, Washington, DC, USA, 115-124 (Feb 2015), and accessible via <http://dl.acm.org/citation.cfm?id=2738615>

and also

J. Pallister, K. Eder, S. Hollis, J. Bennett. A high-level model of embedded flash energy consumption. In Proceedings of the 2014 International Conference on Compilers, Architecture and Synthesis for Embedded Systems (CASES '14). ACM, Article 20, 9 pages, and accessible via DOI=10.1145/2656106.2656108 or <http://doi.acm.org/10.1145/2656106.2656108>

- machine guided approaches to optimize programs in terms of performance and energy with first results published as C. Blackmore, O. Ray and K. Eder. 2015. "A logic programming approach to predict effective compiler settings for embedded software". Theory and Practice of Logic Programming. 15, pp 481-494, September 2015, and accessible via DOI:10.1017/S1471068415000174

- energy consumption static analysis (ECSA) as published in N. Grech, K. Georgiou, J. Pallister, S. Kerrison, J. Morse and K. Eder. 2015. "Static analysis of energy consumption for LLVM IR programs". In Proceedings of SCOPES 2015, pages 12-21, ACM, and accessible at <http://dl.acm.org/citation.cfm?id=2764974> and, in collaboration with ENTRA partners, also U. Liqat, S. Kerrison, A. Serrano, K. Georgiou, P. Lopez-Garcia, N. Grech, M.V. Hermenegildo, K. Eder. 2014. "Energy Consumption Analysis of Programs based on XMOS ISA-Level Models". 23rd International Symposium on Logic-Based Program Synthesis and Transformation (LOPSTR), pp. 72-90. LNCS 8901. Springer, Dec 2014, and accessible via DOI: 10.1007/978-3-319-14125-1_5.