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Wai Ling Yee* (wlyee@uwindsor.ca), Department of Mathematics and Statistics, Lambton Tower, 10th Floor, University of Windsor, Windsor, Ontario N9B 3P4, Canada. *Signed Kazhdan-Lusztig polynomials and the Unitary Dual Problem.*

A crucial problem in representation theory is the determination of the structure of a representation. A celebrated result of this nature is the Kazhdan-Lusztig Conjecture, which describes the composition factors and Jantzen filtration of a Verma module in terms of Kazhdan-Lusztig polynomials. These polynomials are difficult to compute and have become an active subject of research in combinatorics.

For the purpose of realizing a powerful and broad programme in abstract harmonic analysis proposed by Gelfand in the 1930s, mathematicians wish to solve the unitary dual problem. This amounts to computing signatures of invariant Hermitian forms and determining when the form is positive definite. A variation of Kazhdan-Lusztig polynomials arises in these computations. These so-called signed Kazhdan-Lusztig polynomials store signature information in addition to structural information. Computing and understanding them is fundamental to solving the unitary dual problem. Like Kazhdan-Lusztig polynomials, signed Kazhdan-Lusztig polynomials are described by recursive formulas, but as they were introduced recently, the problem of computing them is mostly unstudied. (Received September 17, 2007)