Annotated Bibliography

(Andrew Nassif) (Oakland University)

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Almeida, J., Costa, C. & Zeitoun, M. (2015). McCammond's normal forms for free aperiodic semigroups revisited. *LMS Journal of Computation and Mathematics,* 18, pp 130-147. doi:10.1112/S1461157014000448.

This paper talks about reassuring and proving McCammond's solution for interpreting w-terms through transforming it using finite aperiodic semigroups. It does that so that the computation is easier using Mathematical physics as well as leads to determining the power of w in terms. It proves its argument through mathematical equations. An example that it shows it the fact that it talks about its mathematical proof in terms of the w-terms and alphabetized functions. This helps make mathematical computation much easier, which results in faster computation on the computer. He also mentions talking about mapping such sub-groups and nominal terms in an attempt to compute the groups visually. This leads to more proof of the political correctness of McCammond's theory. Its whole implications to mathematics is in itself fascinating and can be used in many different ways. This argument shows the logical aspect behind it and its implications. This furthermore emphasizes an example of pure logical reasoning as well as mathematical reasoning when dealing with problems like these in alphabetized sub-terms and semi-groups. Overall, the paper does well in giving a background for more scientist to look back at the equations and test them as well as using it for pure computation in the future. This will lead to more accurate mathematical theorems and advances over time, which makes everybody more prepared to answer some of the world's toughest questions.

Couveignes & Ezome (2015). Computing functions on Jacobians and their quotients. *LMS Journal of Computation and Mathematics*, 18, pp 555-577. doi:10.1112/S1461157015000169.

This paper talks about computing functions for Jacobian varieties and quotients in their nominal forms and curves. It does that so this can lead to easier computation when measuring the curves of Jacobians and measuring their overall quantity in functions. This is an example of a reasonable argument because it comes with a mathematical proof for these sort of equations. Throughout this paper you will see many forms of mathematical reasoning, as well as quantitative measurements for these sort of equations and functions. This furthermore emphasizes the theories behind computing Jacobians, through isogenies functions and evaluating equations and algorithms. This also furthermore emphasizes looking at quasi-linear time as well as evaluating equations mathematically through a better use of computational theory. Overall this can have many implications in mathematics and can be fairly useful when looking at Mathematical Physics theories regarding Jacobians. Thus, this will than lead to evaluating these sort of functions correctly and without incorrectness or redundancy. This will then help standardize the functions and getting the correct terms of its nominal forms. The argument the author have proven is setting up a method for standardizing equations for Jacobians and mathematical isogenies. This will than lead to many implications for similar type of problems in the future.

Gu, Z. & Chen, Y. (2015). Piecewise Legendre spectral-collocation method for Volterra integro-differential equations. *LMS Journal of Computation and Mathematics,* 18, pp 231-249. doi:10.1112/S1461157014000485.

This paper talks about different implications of Volterra integro-differential equations through the

PLSC method. He does this through analyzing different numerical errors or examples and explaining the results.The author is creating a sense of mathematical realization for his hypothesis in order to test a theory. The theory he is testing is the PLSC method using mathematical analysis. He than compares it to other methods such as the Piecewise Polynomial method. This makes computing these problems much more easier as well as more convenient. Another fascinating analysis the author does is testing it through standard interval forms, as well as showing the equations. This furthermore explains the mathematics behind the PLSC method as well as the experimentation required to analyze it through a theoretical aspect. The author is than establishing much more credibility by doing it in this manner. He is able to set an explanation for a lengthwise theory and then show the steps required to analyze it. This thus makes it a fascinating paper in the field of computational mathematics. His overall argument is analyzing common numerical errors and forming a more compact mathematical proof for the PLSC method which will help revolutionize how we look at differential equations through this implication. This then makes the computation slightly more accurate and convenient.

Lubicz & Robert (2015). Computing separable isogenies in quasi-optimal time. *LMS Journal of Computation and Mathematics*, 18, pp 198-216. doi:10.1112/S146115701400045X.

This paper talks about "Computing separable isogenies in quasi-optimal time" which mentions mathematical polarization through the Riemann form. The author begins by establishing credibility through an abstract and an introduction to his paper. From there he talks about the mathematical reasoning behind separate isogenies, as well as computing them through quasi-optimal time. The argument through this paper is him using mathematical reasoning and computation in order to end up with his results for the paper. In this paper he also classifies integers, subgroups, and isotropic forms as well as functions. This is helpful because it makes the mathematical analysis of quasi-optimal time through a theoretical physics, and mathematical computation standpoint, much more easier. The author is simply using mathematical formulas and logical reasoning in order to get his point across. This helps you understand the author's process of thinking when coming up with these types of problems, as well as analyzing them for purposes of mathematical computation. What he is trying to argue overall is classifications of isotropic groups for computing separable isogenies to better optimize it for measurement through Quasi-Optimal time. This will eventually lead to scientist questioning or answering proofs in the Riemann Hypothesis, Mathematical Physics, and Theoretical Physics. This is overall an argument from both a pure computational yet theoretical physics standpoint. This can lead to better classifying how we compute things and doing it in a more optimal method.

Milio, E. (2015). A quasi-linear time algorithm for computing modular polynomials in dimension

2. *LMS Journal of Computation and Mathematics,* 18, pp 603-632. doi:10.1112/S1461157015000170.

The author is trying to make a similar argument as the previous. His paper is just as the title says, which is calculating quasi-linear time algorithms in order to have modular polynomials in the 2nd dimension, in terms of mathematics. He implies the argument with emphasis on logical reasoning in order to coincide with his mathematical reasoning. He has something to test called the hypothesis, which is the calculation method. His experiment is conducting these mathematical calculations or providing a valid reason for these theories through correct reasoning. He ultimately is using critical thinking, logic, mathematical notation, and interval notation throughout the paper. In the paper it has equations to back up his calculations as well as valid standardized notation. The author is overall trying to explain as well as emphasis a form of mathematical computation for quasi-linear time and does this in a well organized manner of sophistication. Overall he concludes by reinstating his position through evaluating isogenies and curves in polynomial and standardized notation for quasi-linear time. This will help us evaluate the nominal forms of these equations in Quasi-Linear time in an optimal methods which is further another way of classifying them. This further proves the last paper and also implies it more specifically to 2nd dimensional modular polynomials.

Vonk, J. (2015). Computing overconvergent forms for small primes. *LMS Journal of Computation and Mathematics,* 18, pp 250-257. doi:10.1112/S1461157015000042.

He analyzes different conjunctures in order to factor out forms for small primes. The method he does this (as stated in the title) is by computing overconvergent forms. The author tries to establish his claim by explaining the mathematical reasoning behind this procedure and does so correctly. Overall he also mentions slope sequences, and mathematical bounds and patterns. As mentioned, since mathematics have to do with the laws of nature and reasoning, this is an example of mathematical reasoning. It is also an example of experimental validation because he uses a sequence of steps therefore explaining the right moment for realizing the patterns or methods behind every equation. This helps people understand small prime forms more and therefore compute them better, giving this paper a purpose as a source of explanation. The author is overall isn't trying to argue something in general but rather analyze something and provide new ideas on establishing slope sequences, mathematical bounds and the patterns we mentioned earlier. He has led to more questions that can answered when looking at his analysis such as how further methods similar to this can be used to compute overconvergent forms in terms of factoring out small primes. He is ultimately further emphasizing a method of the types of mathematical analysis used in his papers.