The pointwise behavior of Riemann's function

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In this talk we will present a new and simple method for the determination of the pointwise Hölder exponent of Riemann's function

$$\sum_{n=1}^{\infty} \frac{\sin(\pi n^2 x)}{n^2}$$

at every point of the real line. In contrast to other approaches, where wavelet analysis and the theta modular group were needed for the analysis of irrational points, our method is direct and elementary, being only based on the following tools from number theory and complex analysis: the evaluation of quadratic Gauss sums, the Poisson summation formula, and Cauchy's theorem.

The talk is based on collaborative work with Frederik Broucke.