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Department of Mathematics and Statistics		IONG REACH
	S BI CHIMESIT CIA	and a second material
	Alexander Graham	Summary
** * * * * * * * * * * * * * * * *		
One of the greatest challenges in	Department of Mathematics	We can rewrite the function in the
Scientific Computing is overcoming	N 1 1145 05027 4648	following method to avoid this trouble:
error in representation. Since the	Results	
computer can only compute a finite	0.6 2.6 100000 4.6 1964	$(\sqrt{x} + 4 - 2)$
number of operations, one must be	TH TE THE A THREEDO	$(\sqrt{r^4 + 4} + 2)$
aware of data that is lost due to round-	Using Numerical Software, such as	$(\sqrt{x^4 + 4} - 2) \frac{(\sqrt{x^4 + 4} + 2)}{\sqrt{x^4 + 4}}$
off error. In this presentation, we	MatLab, we find that as x gets closer to	$(\sqrt{x^4 + 4 + 2})$
illustrate an example and a method to	0, our approximation gets worse	
reconstruct our problem	because we are subtracting close	
	numbers, and the computer can only	$(\sqrt{x^4 + 4} + 2)$
	store a finite number of digits. If we	These two functions are equivalent
	evaluate at 10 [^] (-10), we find that we	herause we simply multiplied by a
1 4 2 4 2 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4	Iose 9 significant bits by the following	special value of one (the conjugate) to
Let's show where subtraction of near	theorem: The Constraint of the	oliminate the lease of significance. Our
close numbers can go wrong by finding	傳音時 当 非常非常有自己的有限的现在分词	entrinate the loss of significance. Our
a way of computing $\sqrt{x^4 + 4} - 2$ without	예정물 좀 좀 두 속도 쓰던 유수물주 영향.	answer also goes to o as x goes to o.
loss of undue significance. If we	- 原語員 市 ふ おりまえざき 見得しと発言。	Conclusion
compute by hand we have the following:	Let x and y be positive normalized	PALE CONCIUSION
	floating point numbers. In the subtraction	Controlling error is key for many applied
$\sqrt{x^2 + 4} - 2 = 0$	x – y, r significant bits are lost where g	mathematicians. It is used frequently in
$\sqrt{r^4 + 4}$ 2	<pre>r <= p and 2^-p <= 1 -y/x <= 2^-g for</pre>	the signals, and
$\sqrt{x} + 4 = 2$	some positive integers p and q.	digital filters to maintain consistency
$x^4 + 4 = 4$	0669 STUZEZAP 6 NY	within programs. Similar techniques can
AX4 0 UX # 0X751	L NGKTE BEREBRER T NAG	be used with transcendental functions.
$x^4 = 0$	72441 701051 L 7 EU	by expanding them into their respective
r=0	waarv arexee r a va	Taylor polynomials. This is one of many
	Our numerical program shows us that	tools we can use to increase our
	10^(-10) yields .0000000003, while	understanding of numerical data in
	10^(-11) yields .00000000075, but this	Scientific Computing
	is false simply because the function is	
212 795 \ / 591	strictly increasing for $x > 0$. Our function	Acknowledgements 9
	becomes unstable for x close to 0, so	10 Violand Violageniento
347 182 917	we need to make a slight adjustment to	Computer Arithmetic Algorithms
196 492	avoid subtraction by like terms.	Israel Koren, Prentice-Hall 2002
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		Numerical Analysis
0.1	(1154 01 601 9 90 0 64	Kincaid & Cheney AMS 2002
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