

## 252.eon, Kajiya command line

### Datasets profile vs. Reference Dataset

The following are the profiles for the 252.eon benchmark, Kajiya command line. For more details about our profile development and dataset reduction methodology, refer to the paper by AJ KleinOsowski and David J. Lilja, "MinneSPEC: A New SPEC Benchmark Workload for Simulation-Based Computer Architecture Research", Computer Architecture Letters, Volume 1, June 2002. This paper is available in electronic form at <http://www.arctic.umn.edu/~lilja/minnespec/index.html>



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## Function level execution profile at optimization level O0

The following table contains function execution profiles and goodness-of-fit chi-squared statistic values for the train.Kajiya, test.Kajiya, lgred.Kajiya, mdred.Kajiya, and smred.Kajiya datasets as compared to the full SPEC reference datasets. This data was gathered with the hiprof profiling utility. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.Kajiya, Train.Kajiya, Test.Kajiya, Lgred.Kajiya, MdRed.Kajiya, and SmRed.Kajiya columns are the percent of overall execution time spent in the stated function (in the Function column). Numbers in the Train.Kajiya Chi, Test.Kajiya Chi, LgRed.Kajiya Chi, MdRed.Kajiya Chi, and SmRed.Kajiya Chi are the terms of the chi-squared statistic for the stated function (in the function column).

Function	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi
proc_at_0x12011ece8	9.00	9.10	0.00	8.80	0.00	8.40	0.04	8.70	0.01	9.20	0.00
ggSpectrum::Set(float)	7.40	7.30	0.00	7.20	0.01	7.60	0.01	7.40	0.00	8.20	0.09
proc_at_0x12011ed98	3.70	3.70	0.00	3.70	0.00	3.80	0.00	3.60	0.00	4.30	0.10
mrSurfaceList::shadowHit	2.10	2.10	0.00	1.90	0.02	2.10	0.00	1.90	0.02	2.10	0.00
ggRayXZRectangleIntersect	1.70	1.70	0.00	1.90	0.02	1.60	0.01	1.40	0.05	2.10	0.09
proc_at_0x12013a968	1.70	1.60	0.01	1.80	0.01	1.60	0.01	1.90	0.02	1.80	0.01
ggSpectrum::operator=(const ggSpectrum&)	1.60	1.60	0.00	1.60	0.00	1.60	0.00	1.50	0.01	1.20	0.10
proc_at_0x12016a70c	1.40	1.40	0.00	1.30	0.01	1.40	0.00	1.50	0.01	1.50	0.01
mrMaterial::shadowHit	1.40	1.40	0.00	1.30	0.01	1.50	0.01	1.50	0.01	1.10	0.06
operator(const ggSpectrum&, const ggSpectrum&)	1.30	1.30	0.00	1.40	0.01	1.40	0.01	1.40	0.01	1.00	0.07
proc_at_0x1201018c8	1.20	1.30	0.01	1.30	0.01	1.10	0.01	1.40	0.03	1.20	0.00
proc_at_0x12011ee28	1.20	1.10	0.01	1.00	0.03	1.20	0.00	1.30	0.01	0.80	0.13
sqrt	1.20	1.20	0.00	1.20	0.00	1.20	0.00	1.40	0.03	1.50	0.08
operator(const ggHRigidBodyMatrix3&, const ggPoint3&)	1.10	1.20	0.01	0.80	0.08	1.10	0.00	1.10	0.00	0.90	0.04
mrSurfaceList::viewingHit	1.10	1.20	0.01	1.20	0.01	1.20	0.01	1.00	0.01	1.50	0.15
proc_at_0x120138730	1.10	1.10	0.00	1.10	0.00	1.00	0.01	1.30	0.04	1.30	0.04
proc_at_0x12016acd0	1.10	1.10	0.00	1.20	0.01	1.20	0.01	0.90	0.04	1.00	0.01
proc_at_0x12016ab38	1.00	1.00	0.00	1.10	0.01	1.10	0.01	0.90	0.01	1.00	0.00
proc_at_0x120101fc8	0.90	0.90	0.00	1.00	0.01	0.90	0.00	1.10	0.04	0.60	0.10
mrPixelRenderer::directLight	0.90	0.90	0.00	0.80	0.01	0.90	0.00	0.80	0.01	1.00	0.01
mrXZRectangle::shadowHit	0.80	0.90	0.01	0.90	0.01	0.90	0.01	0.70	0.01	1.00	0.05
proc_at_0x12016ac80	0.80	0.80	0.00	0.80	0.00	0.80	0.00	0.60	0.05	0.80	0.00
proc_at_0x12010184c	0.80	0.80	0.00	0.70	0.01	0.90	0.01	0.80	0.00	0.80	0.00
proc_at_0x12016a7ec	0.80	0.80	0.00	0.70	0.01	0.90	0.01	1.00	0.05	0.60	0.05
operator(const ggHRigidBodyMatrix3&, const ggVector3&)	0.80	0.80	0.00	0.90	0.01	0.70	0.01	0.70	0.01	0.60	0.05
proc_at_0x12016a5f8	0.80	0.70	0.01	0.70	0.01	0.80	0.00	0.60	0.05	0.20	0.45
mrKajiyaPixelRenderer::KajiyaRadiance	0.70	0.70	0.00	0.70	0.00	0.70	0.00	0.70	0.00	0.90	0.06
mrInstance::shadowHit	0.70	0.70	0.00	0.80	0.01	0.60	0.01	0.60	0.01	1.20	0.36
proc_at_0x12013a5e0	0.70	0.70	0.00	0.70	0.00	0.80	0.01	0.60	0.01	0.60	0.01
proc_at_0x120139688	0.70	0.70	0.00	0.70	0.00	0.70	0.00	0.70	0.00	0.30	0.23
proc_at_0x120101e28	0.70	0.70	0.00	0.70	0.00	0.70	0.00	0.50	0.06	0.70	0.00
mrGrid::viewingHit	0.70	0.70	0.00	0.50	0.06	0.70	0.00	1.00	0.13	0.60	0.01
proc_at_0x12016b890	0.70	0.60	0.01	0.80	0.01	0.60	0.01	0.50	0.06	0.50	0.06
proc_at_0x12013b090	0.70	0.70	0.00	0.80	0.01	0.70	0.00	0.80	0.01	0.60	0.01
mrGrid::shadowHit	0.70	0.60	0.01	0.70	0.00	0.70	0.00	0.70	0.00	0.80	0.01
mrMaterial::boundingBox	0.70	0.70	0.00	0.50	0.06	0.70	0.00	0.80	0.01	0.50	0.06
proc_at_0x12010db4c	0.60	0.60	0.00	0.60	0.00	0.50	0.02	0.60	0.00	0.50	0.02
proc_at_0x120101f78	0.60	0.70	0.02	0.60	0.00	0.60	0.00	0.80	0.07	0.60	0.00
proc_at_0x12016b800	0.60	0.60	0.00	0.80	0.07	0.60	0.00	0.60	0.00	0.40	0.07
proc_at_0x1201016d0	0.60	0.60	0.00	0.50	0.02	0.60	0.00	0.60	0.00	0.70	0.02

proc_at_0x12016af40	0.60	0.50	0.02	0.60	0.00	0.60	0.00	0.50	0.02	0.30	0.15
proc_at_0x12016a448	0.60	0.60	0.00	0.50	0.02	0.60	0.00	0.50	0.02	0.60	0.00
proc_at_0x12016a8a8	0.60	0.50	0.02	0.50	0.02	0.50	0.02	0.50	0.02	0.60	0.00
proc_at_0x12016a828	0.50	0.50	0.00	0.60	0.02	0.50	0.00	0.50	0.00	0.60	0.02
proc_at_0x12010d64c	0.50	0.60	0.02	0.60	0.02	0.50	0.00	0.60	0.02	0.30	0.08
proc_at_0x12016b02c	0.50	0.50	0.00	0.20	0.18	0.60	0.02	0.50	0.00	0.50	0.00
proc_at_0x12016b708	0.50	0.60	0.02	0.50	0.00	0.50	0.00	0.70	0.08	0.70	0.08
ggDiffuseVector	0.50	0.50	0.00	0.60	0.02	0.40	0.02	0.50	0.00	0.80	0.18
proc_at_0x12016a868	0.50	0.50	0.00	0.50	0.00	0.50	0.00	0.50	0.00	0.80	0.18
proc_at_0x120138bc8	0.50	0.50	0.00	0.40	0.02	0.60	0.02	0.40	0.02	0.30	0.08
mrMaterial::viewingHit	0.50	0.60	0.02	0.70	0.08	0.40	0.02	0.30	0.08	0.30	0.08
proc_at_0x12016ad20	0.50	0.50	0.00	0.60	0.02	0.50	0.00	0.30	0.08	0.40	0.02
proc_at_0x12016b840	0.50	0.50	0.00	0.50	0.00	0.50	0.00	0.60	0.02	0.10	0.32
proc_at_0x12016aff0	0.50	0.50	0.00	0.70	0.08	0.50	0.00	0.70	0.08	0.30	0.08
proc_at_0x12016a900	0.50	0.50	0.00	0.60	0.02	0.50	0.00	0.40	0.02	0.70	0.08
proc_at_0x12013a3c8	0.50	0.50	0.00	0.30	0.08	0.50	0.00	0.60	0.02	0.30	0.08
proc_at_0x120138100	0.50	0.50	0.00	0.60	0.02	0.50	0.00	0.30	0.08	0.30	0.08
proc_at_0x12013805c	0.50	0.50	0.00	0.40	0.02	0.50	0.00	0.50	0.00	0.50	0.00
_OtsDivide64	0.50	0.50	0.00	0.60	0.02	0.50	0.00	0.90	0.32	0.70	0.08
proc_at_0x12013ad90	0.50	0.50	0.00	0.40	0.02	0.50	0.00	0.50	0.00	0.50	0.00
proc_at_0x12013a7f4	0.50	0.40	0.02	0.40	0.02	0.40	0.02	0.40	0.02	0.30	0.08
proc_at_0x120101810	0.40	0.50	0.02	0.60	0.10	0.50	0.02	0.50	0.02	0.40	0.00
proc_at_0x120138670	0.40	0.40	0.00	0.40	0.00	0.50	0.02	0.40	0.00	0.20	0.10
ggSpectrum::operator+=(const ggSpectrum&)	0.40	0.40	0.00	0.50	0.02	0.40	0.00	0.60	0.10	0.40	0.00
proc_at_0x120138b04	0.40	0.50	0.02	0.30	0.03	0.30	0.03	0.60	0.10	0.60	0.10
proc_at_0x120138450	0.40	0.40	0.00	0.40	0.00	0.40	0.00	0.40	0.00	0.30	0.03
proc_at_0x1201386b0	0.40	0.40	0.00	0.30	0.03	0.40	0.00	0.40	0.00	0.70	0.23
proc_at_0x12016a650	0.40	0.40	0.00	0.40	0.00	0.40	0.00	0.40	0.00	0.40	0.00
proc_at_0x1201386f0	0.40	0.40	0.00	0.30	0.03	0.50	0.02	0.40	0.00	0.60	0.10
mrInstance::selectVisiblePoint operator(float,constggSpectrum &)	0.40	0.40	0.00	0.60	0.10	0.50	0.02	0.40	0.00	0.30	0.03
proc_at_0x12010d6c8	0.40	0.50	0.02	0.50	0.02	0.40	0.00	0.40	0.00	0.60	0.10
ggRayYZRectangleIntersect	0.40	0.40	0.00	0.50	0.02	0.60	0.10	0.30	0.03	0.70	0.23
proc_at_0x120139648	0.40	0.40	0.00	0.50	0.02	0.40	0.00	0.40	0.00	0.30	0.03
proc_at_0x12016b068	0.40	0.50	0.02	0.30	0.03	0.50	0.02	0.30	0.03	0.60	0.10
proc_at_0x120138564	0.40	0.40	0.00	0.60	0.10	0.40	0.00	0.30	0.03	0.50	0.02
proc_at_0x12010db88	0.40	0.40	0.00	0.20	0.10	0.50	0.02	0.50	0.02	0.10	0.23
proc_at_0x12010dbc8	0.40	0.40	0.00	0.40	0.00	0.30	0.03	0.30	0.03	0.30	0.03
proc_at_0x12016ac2c	0.40	0.40	0.00	0.40	0.00	0.40	0.00	0.30	0.03	0.60	0.10
proc_at_0x12016a49c	0.40	0.40	0.00	0.40	0.00	0.40	0.00	0.40	0.00	0.50	0.02
proc_at_0x12010d688	0.40	0.40	0.00	0.30	0.03	0.40	0.00	0.40	0.00	0.60	0.10
proc_at_0x120101da8	0.40	0.40	0.00	0.30	0.03	0.40	0.00	0.40	0.00	0.20	0.10
proc_at_0x12016a57c	0.40	0.40	0.00	0.30	0.03	0.30	0.03	0.40	0.00	0.20	0.10
proc_at_0x12010dafc	0.40	0.30	0.03	0.50	0.02	0.40	0.00	0.30	0.03	0.50	0.02
proc_at_0x12010daa8	0.40	0.40	0.00	0.30	0.03	0.30	0.03	0.30	0.03	0.60	0.10
proc_at_0x120101888	0.40	0.30	0.03	0.30	0.03	0.30	0.03	0.30	0.03	0.60	0.10
ggRayBoxIntersect	0.30	0.30	0.00	0.30	0.00	0.40	0.03	0.40	0.03	0.40	0.03
proc_at_0x120138510	0.30	0.40	0.03	0.30	0.00	0.30	0.00	0.30	0.00	0.20	0.03
proc_at_0x12016a408	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.20	0.03	0.20	0.03
proc_at_0x12010d554	0.30	0.40	0.03	0.30	0.00	0.30	0.00	0.40	0.03	0.30	0.00
proc_at_0x120133dc8	0.30	0.30	0.00	0.40	0.03	0.40	0.03	0.30	0.00	0.40	0.03
proc_at_0x12016a540	0.30	0.40	0.03	0.30	0.00	0.30	0.00	0.30	0.00	0.60	0.30
ggRayXYRectangleIntersect	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.50	0.13	0.50	0.13
ggDiffuseMaterial::getInfo	0.30	0.30	0.00	0.30	0.00	0.40	0.03	0.40	0.03	0.30	0.00
proc_at_0x12016a6b8	0.30	0.30	0.00	0.30	0.00	0.40	0.03	0.30	0.00	0.30	0.00
proc_at_0x12010d5a8	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.40	0.03	0.30	0.00

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proc_at_0x1201385f0	0.30	0.30	0.00	0.40	0.03	0.30	0.00	0.40	0.03	0.20	0.03
proc_at_0x120135afc	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.20	0.03	0.30	0.00
proc_at_0x120135aa8	0.30	0.30	0.00	0.50	0.13	0.30	0.00	0.20	0.03	0.10	0.13
proc_at_0x120138630	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.40	0.03	0.20	0.03
my_rand(void)	0.30	0.30	0.00	0.20	0.03	0.30	0.00	0.30	0.00	0.30	0.00
proc_at_0x12016aa1c	0.30	0.30	0.00	0.30	0.00	0.40	0.03	0.40	0.03	0.30	0.00
proc_at_0x1201385b4	0.30	0.30	0.00	0.20	0.03	0.20	0.03	0.30	0.00	0.20	0.03
operator(constggHRigidBody Matrix3&,constggRay3&)	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.00	0.30
sin	0.30	0.30	0.00	0.30	0.00	0.40	0.03	0.30	0.00	0.50	0.13
mrDiffuseAreaXZRectangleLu minaire::shadowHit	0.30	0.30	0.00	0.20	0.03	0.40	0.03	0.30	0.00	0.30	0.00
proc_at_0x12016b168	0.30	0.30	0.00	0.40	0.03	0.20	0.03	0.30	0.00	0.30	0.00
proc_at_0x12016a5b8	0.30	0.30	0.00	0.20	0.03	0.40	0.03	0.30	0.00	0.20	0.03
mrXZRectangle::viewingHit	0.30	0.30	0.00	0.30	0.00	0.20	0.03	0.20	0.03	0.30	0.00
proc_at_0x120138ab4	0.30	0.30	0.00	0.20	0.03	0.30	0.00	0.30	0.00	0.10	0.13
proc_at_0x120138e64	0.30	0.30	0.00	0.20	0.03	0.30	0.00	0.20	0.03	0.20	0.03
mrMaterial::selectVisiblePoint	0.30	0.20	0.03	0.30	0.00	0.30	0.00	0.20	0.03	0.20	0.03
proc_at_0x1201384a8	0.30	0.30	0.00	0.20	0.03	0.30	0.00	0.10	0.13	0.30	0.00
proc_at_0x120101d68	0.30	0.20	0.03	0.30	0.00	0.30	0.00	0.20	0.03	0.00	0.30
cos	0.30	0.20	0.03	0.20	0.03	0.30	0.00	0.20	0.03	0.10	0.13
proc_at_0x12016a260	0.30	0.20	0.03	0.20	0.03	0.20	0.03	0.30	0.00	0.50	0.13
proc_at_0x12010d708	0.20	0.20	0.00	0.40	0.20	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x120135de8	0.20	0.20	0.00	0.20	0.00	0.30	0.05	0.20	0.00	0.20	0.00
proc_at_0x12016a75c	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.30	0.05	0.30	0.05
proc_at_0x12013ac70	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.10	0.05	0.10	0.05
proc_at_0x120135d28	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x120138788	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x120134310	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.20	0.00	0.30	0.05
proc_at_0x120101de8	0.20	0.20	0.00	0.10	0.05	0.10	0.05	0.30	0.05	0.10	0.05
proc_at_0x12011ec90	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05	0.10	0.05
proc_at_0x12010de78	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x12013631c	0.20	0.20	0.00	0.10	0.05	0.30	0.05	0.20	0.00	0.10	0.05
proc_at_0x120134108	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.40	0.20
proc_at_0x120138b54	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.20	0.00	0.20	0.00
proc_at_0x12010dcc8	0.20	0.20	0.00	0.20	0.00	0.10	0.05	0.20	0.00	0.10	0.05
proc_at_0x1201382f4	0.20	0.20	0.00	0.20	0.00	0.30	0.05	0.20	0.00	0.10	0.05
proc_at_0x1200e4218	0.20	0.20	0.00	0.30	0.05	0.20	0.00	0.30	0.05	0.10	0.05
proc_at_0x120138410	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05
mrYZRectangle::viewingHit	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x12010ddd8	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00	0.20	0.00
proc_at_0x12016a2f8	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.10	0.05	0.30	0.05
proc_at_0x120133acc	0.20	0.20	0.00	0.10	0.05	0.20	0.00	0.20	0.00	0.10	0.05
proc_at_0x12016ad98	0.20	0.20	0.00	0.20	0.00	0.10	0.05	0.10	0.05	0.10	0.05
proc_at_0x120138398	0.20	0.20	0.00	0.20	0.00	0.10	0.05	0.10	0.05	0.20	0.00
proc_at_0x12017e278	0.10	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00
proc_at_0x1201383d4	0.10	0.20	0.10	0.20	0.10	0.20	0.10	0.10	0.00	0.20	0.10
mrXYRectangle::shadowHit	0.10	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00
mrInstance::boundingBox	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x1201022f8	0.10	0.20	0.10	0.20	0.10	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x120135ba0	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.20	0.10
proc_at_0x120102398	0.10	0.10	0.00	0.20	0.10	0.20	0.10	0.20	0.10	0.00	0.10
mrXYRectangle::viewingHit	0.10	0.20	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00
proc_at_0x1200e4174	0.10	0.10	0.00	0.30	0.40	0.10	0.00	0.20	0.10	0.30	0.40
proc_at_0x120138d34	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00
mrXZRectangle::boundingBox	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120138c18	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.20	0.10	0.00	0.10
proc_at_0x120133e98	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10

252.eon, kajiya command line

proc_at_0x1201362cc	0.10	0.10	0.00	0.10	0.00	0.20	0.10	0.20	0.10	0.20	0.10
mrDiffuseAreaXZRectangleLu minaire::selectVisiblePoint	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.30	0.40
proc_at_0x120101bc8	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120135bf8	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x120102348	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x120133f28	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.30	0.40
proc_at_0x12016a3b8	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120138ce0	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
mrYZRectangle::shadowHit	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x120133818	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.10	0.00
proc_at_0x120137338	0.10	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00
proc_at_0x1200e40d4	0.10	0.10	0.00	0.40	0.90	0.10	0.00	0.30	0.40	0.40	0.90
proc_at_0x12010176c	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
mrXYRectangle::boundingBox	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120136408	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x12010de28	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.30	0.40
proc_at_0x12017e41c	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
mrYZRectangle::boundingBox	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.10	0.00
proc_at_0x1200e4d88	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x120133858	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120101b8c	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.10	0.00
proc_at_0x120136108	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x12016ae48	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x12016b5f4	0.10	0.10	0.00	0.10	0.00	0.00	0.10	0.10	0.00	0.10	0.00
proc_at_0x120133e30	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x12017d610	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00
proc_at_0x12017e12c	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x12017eee0	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x120136158	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x1201752f0	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x120135ed0	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x120134750	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.30	0.40
proc_at_0x1200e45a4	0.10	0.10	0.00	0.20	0.10	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x120133c5c	0.10	0.10	0.00	0.00	0.10	0.00	0.10	0.10	0.00	0.10	0.00
ggDiffuseBRDF::value	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x12017e0d8	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x1200e47e0	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x12017ecf4	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.10	0.00
proc_at_0x120134f6c	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x12015af28	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
proc_at_0x120175330	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x1201372fc	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x12015ad18	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.10	0.00
mrInstance::viewingHit	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x120133688	0.10	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.00	0.10
proc_at_0x120133b1c	0.10	0.10	0.00	0.00	0.10	0.00	0.10	0.10	0.00	0.00	0.10
proc_at_0x12017f084	0.10	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10	0.10	0.00
proc_at_0x1200e42d4	0.10	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.10	0.10	0.00
mrKajiyaPixelRenderer::sampl ePixel	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.10	0.00
proc_at_0x1200e4270	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x1200e43e4	0.10	0.10	0.00	0.30	0.40	0.00	0.10	0.20	0.10	0.20	0.10
mrBox::shadowHit	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.00	0.10
proc_at_0x12015adc4	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.00	0.10
Sum	97.30	97.70	0.91	96.80	7.09	97.60	2.77	96.20	6.91	95.00	14.84

252.eon, kajiya command line

Ref	Train	Train	Test	Test	LgRed	LgRed	MdRed	MdRed	SmRed	SmRed
		Chi		Chi		Chi		Chi		Chi

90% Confidence level (205 entries) = 230.277

252.eon, kajiya command line

## Function level execution profile at optimization level O1

The following table contains function execution profiles and goodness-of-fit chi-squared statistic values for the train.Kajiya, test.Kajiya, lgred.Kajiya, mdred.Kajiya, and smred.Kajiya datasets as compared to the full SPEC reference datasets. This data was gathered with the hiprof profiling utility. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.Kajiya, Train.Kajiya, Test.Kajiya, Lgred.Kajiya, MdRed.Kajiya, and SmRed.Kajiya columns are the percent of overall execution time spent in the stated function (in the Function column). Numbers in the Train.Kajiya Chi, Test.Kajiya Chi, LgRed.Kajiya Chi, MdRed.Kajiya Chi, and SmRed.Kajiya Chi are the terms of the chi-squared statistic for the stated function (in the function column).

Function	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi
ggSpectrum::Set(float)	13.80	13.70	0.00	12.80	0.07	13.40	0.01	15.30	0.16	15.60	0.23
proc_at_0x1200ec668	8.70	8.70	0.00	8.40	0.01	8.80	0.00	9.00	0.01	10.10	0.23
proc_at_0x1200ec068	5.50	5.70	0.01	5.20	0.02	4.80	0.09	6.10	0.07	4.30	0.26
mrSurfaceList::viewingHit	5.30	5.60	0.02	6.80	0.42	5.70	0.03	5.10	0.01	7.00	0.55
ggSpectrum::operator=(constggSpectrum&)	5.00	5.10	0.00	3.80	0.29	4.90	0.00	4.90	0.00	7.40	1.15
ggRayXZRectangleIntersect	3.60	3.60	0.00	3.80	0.01	4.20	0.10	3.50	0.00	2.30	0.47
operator(constggSpectrum&,constggSpectrum&)	3.50	3.40	0.00	2.90	0.10	3.60	0.00	3.40	0.00	2.30	0.41
sqrt	3.30	2.90	0.05	4.20	0.25	3.40	0.00	2.30	0.30	2.30	0.30
mrSurfaceList::shadowHit	3.10	3.30	0.01	3.70	0.12	3.10	0.00	2.90	0.01	2.70	0.05
mrkPixelRenderer::directLight	2.60	2.50	0.00	2.10	0.10	3.30	0.19	2.00	0.14	3.90	0.65
mrXZRectangle::shadowHit	2.50	2.40	0.00	2.00	0.10	2.50	0.00	3.10	0.14	1.60	0.32
ggDiffuseMaterial::getInfo	2.40	2.30	0.00	2.30	0.00	2.40	0.00	3.00	0.15	1.60	0.27
mrGrid::viewingHit	2.30	2.30	0.00	2.80	0.11	2.20	0.00	2.00	0.04	1.20	0.53
operator(constggHRigidBodyMatrix3&,constggRay3&)	2.20	2.20	0.00	1.80	0.07	2.30	0.00	2.30	0.00	1.90	0.04
mrGrid::shadowHit	2.20	2.10	0.00	3.10	0.37	2.30	0.00	2.10	0.00	2.70	0.11
mrKajiyaPixelRenderer::KajiyaRadiance	2.00	2.00	0.00	1.80	0.02	1.70	0.05	1.50	0.13	0.80	0.72
mrInstance::shadowHit	1.80	2.10	0.05	2.50	0.27	2.20	0.09	1.90	0.01	2.30	0.14
mrMaterial::viewingHit	1.70	1.60	0.01	1.20	0.15	1.50	0.02	2.30	0.21	0.80	0.48
operator(constggHRigidBodyMatrix3&,constggPoint3&)	1.40	1.40	0.00	1.50	0.01	1.40	0.00	1.40	0.00		1.40
mrInstance::selectVisiblePoint	1.40	1.50	0.01	1.50	0.01	1.40	0.00	2.10	0.35	1.20	0.03
mrMaterial::boundingBox	1.30	1.30	0.00	1.80	0.19	1.30	0.00	1.80	0.19	0.80	0.19
operator(constggHRigidBodyMatrix3&,constggVector3&)	1.30	1.30	0.00	1.60	0.07	0.90	0.12	0.80	0.19	3.10	2.49
mrXZRectangle::viewingHit	1.20	1.10	0.01	1.00	0.03	1.30	0.01	0.80	0.13		1.20
sin	1.20	1.00	0.03	1.20	0.00	0.80	0.13	1.30	0.01	1.20	0.00
proc_at_0x1200ebe48	1.20	1.20	0.00	0.80	0.13	1.10	0.01	0.60	0.30	0.40	0.53
mrDiffuseAreaXZRectangleLuminaire::shadowHit	1.10	1.10	0.00	0.80	0.08	1.30	0.04	0.90	0.04	0.80	0.08
ggSpectrum::operator+=(constggSpectrum&)	1.10	1.20	0.01	0.60	0.23	1.00	0.01	1.10	0.00	1.60	0.23
my_rand(void)	1.00	1.20	0.04	1.40	0.16	0.80	0.04	0.30	0.49	0.80	0.04
cos	1.00	1.00	0.00	0.80	0.04	1.00	0.00	1.00	0.00	0.40	0.36
ggDiffuseVector	0.90	1.00	0.01	1.40	0.28	1.20	0.10	1.00	0.01		0.90
ggRayYZRectangleIntersect	0.90	0.80	0.01	1.20	0.10	0.80	0.01	0.90	0.00	0.40	0.28
operator(float,constggSpectrum&)	0.90	0.90	0.00	1.10	0.04	0.70	0.04	1.00	0.01	0.80	0.01
mrYZRectangle::viewingHit	0.80	0.80	0.00	0.50	0.11	0.70	0.01	1.30	0.31	1.60	0.80
ggRayBoxIntersect	0.80	0.80	0.00	1.00	0.05	0.80	0.00	0.10	0.61	1.60	0.80
ggRayXYRectangleIntersect	0.70	0.80	0.01	0.40	0.13	0.50	0.06	0.40	0.13	1.60	1.16
mrXYRectangle::viewingHit	0.60	0.60	0.00	0.50	0.02	0.70	0.02	0.60	0.00	0.80	0.07
mrKajiyaPixelRenderer::samplePixel	0.50	0.40	0.02	0.10	0.32	0.30	0.08	0.10	0.32	0.40	0.02
mrXZRectangle::boundingBox	0.50	0.40	0.02	0.20	0.18	0.50	0.00	0.50	0.00	0.40	0.02

mrInstance::boundingBox	0.50	0.50	0.00	0.30	0.08	0.40	0.02	0.60	0.02	0.40	0.02
mrMaterial::selectVisiblePoint	0.40	0.40	0.00	0.40	0.00	0.30	0.03	0.10	0.23	0.40	0.00
ggDiffuseBRDF::value	0.40	0.50	0.02	0.40	0.00	0.50	0.02	0.60	0.10		0.40
mrXYRectangle::boundingBox	0.40	0.30	0.03	0.20	0.10	0.20	0.10	0.80	0.40	1.20	1.60
mrYZRectangle::shadowHit	0.40	0.40	0.00	0.30	0.03	0.40	0.00		0.40	0.80	0.40
mrDiffuseAreaXZRectangleLuminaire::selectVisiblePoint	0.40	0.40	0.00	0.30	0.03	0.30	0.03	0.50	0.02		0.40
mrYZRectangle::boundingBox	0.30	0.30	0.00	0.40	0.03		0.30	0.30	0.00		0.30
mrXYRectangle::shadowHit	0.30	0.30	0.00	0.30	0.00	0.60	0.30	0.30	0.00		0.30
ggJitterSample2::Generate(void)	0.30	0.30	0.00	0.30	0.00	0.20	0.03	0.30	0.00	0.40	0.03
mrBox::shadowHit	0.30	0.30	0.00	0.10	0.13	0.20	0.03	0.10	0.13		0.30
ggPinholeCamera::getRay	0.20	0.20	0.00	0.20	0.00	0.20	0.00	0.30	0.05		0.20
ggTrain<ggPoint2>::Append(ggPoint2)	0.20	0.10	0.05	0.20	0.00	0.20	0.00	0.30	0.05	0.80	1.80
mrInstance::viewingHit	0.10	0.10	0.00	0.10	0.00		0.10	0.30	0.40		0.10
ggTrain<ggSpectrum>::Append(ggSpectrum)	0.10	0.10	0.00	0.10	0.00	0.20	0.10	0.10	0.00	0.00	0.10
mrBox::viewingHit	0.10	0.20	0.10	0.10	0.00	0.10	0.00	0.30	0.40		0.10
ggDiffuseBRDF::averageValue(void)	0.10	0.10	0.00	0.10	0.00		0.10		0.10		0.10
operator(constggHAffineMatrix3&.&constggPoint3&)	0.10	0.10	0.00		0.10		0.10	0.10	0.00		0.10
Sum	95.90	95.90	0.54	94.40	5.15	94.60	2.54	95.70	6.79	92.70	23.77
	Ref	Train	Train	Test	Test	LgRed	LgRed	MdRed	MdRed	SmRed	SmRed
			Chi		Chi		Chi		Chi		Chi

90% Confidence level (58 entries) = 71.040



## Function level execution profile at optimization level O2

The following table contains function execution profiles and goodness-of-fit chi-squared statistic values for the train.Kajiya, test.Kajiya, lgred.Kajiya, mdred.Kajiya, and smred.Kajiya datasets as compared to the full SPEC reference datasets. This data was gathered with the hiprof profiling utility. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.Kajiya, Train.Kajiya, Test.Kajiya, Lgred.Kajiya, MdRed.Kajiya, and SmRed.Kajiya columns are the percent of overall execution time spent in the stated function (in the Function column). Numbers in the Train.Kajiya Chi, Test.Kajiya Chi, LgRed.Kajiya Chi, MdRed.Kajiya Chi, and SmRed.Kajiya Chi are the terms of the chi-squared statistic for the stated function (in the function column).

Function	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi
mrSurfaceList::shadowHit	7.70	7.90	0.01	6.60	0.16	8.30	0.05	4.90	1.02	7.50	0.01
ggSpectrum::Set(float)	7.10	7.10	0.00	6.20	0.11	7.20	0.00	7.00	0.00	6.30	0.09
proc_at_0x1200ef0b8	6.90	7.20	0.01	7.80	0.12	7.50	0.05	8.20	0.24	5.50	0.28
mrSurfaceList::viewingHit	6.40	5.90	0.04	5.30	0.19	6.50	0.00	6.80	0.02	6.70	0.01
proc_at_0x1200eea58	5.20	5.20	0.00	5.30	0.00	4.70	0.05	4.90	0.02	4.70	0.05
ggSpectrum::operator=(constggSpectrum&)	4.90	4.60	0.02	4.70	0.01	0.40	4.13	4.90	0.00	5.90	0.20
mrMaterial::shadowHit	4.10	4.40	0.02	3.60	0.06	4.30	0.01	4.70	0.09	5.50	0.48
mrKajiyaPixelRenderer::KajiyaRadiance	4.00	4.10	0.00	4.50	0.06	3.50	0.06	3.00	0.25	2.00	1.00
ggRayXZRectangleIntersect	3.60	3.70	0.00	3.60	0.00	3.60	0.00	4.40	0.18	5.50	1.00
operator(constggSpectrum&,constggSpectrum&)	3.00	3.20	0.01	3.40	0.05	2.60	0.05	3.00	0.00	2.00	0.33
operator(constggHRigidBodyMatrix3&,constggRay3&)	3.00	3.40	0.05	3.20	0.01	2.70	0.03	3.50	0.08	2.80	0.01
mrGrid::shadowHit	2.90	2.70	0.01	2.70	0.01	2.50	0.06	3.90	0.34	3.60	0.17
sqrt	2.90	2.90	0.00	3.20	0.03	2.50	0.06	3.00	0.00	2.00	0.28
mrXZRectangle::shadowHit	2.70	2.50	0.01	2.70	0.00	3.10	0.06	1.60	0.45	0.80	1.34
mrGrid::viewingHit	2.50	2.70	0.02	2.60	0.00	2.10	0.06	2.30	0.02	4.30	1.30
mrkPixelRenderer::directLight	2.50	2.40	0.00	2.60	0.00	2.90	0.06	2.20	0.04	2.80	0.04
mrInstance::shadowHit	2.20	2.40	0.02	2.40	0.02	2.50	0.04	2.80	0.16	2.80	0.16
operator(constggHRigidBodyMatrix3&,constggVector3&)	2.10	2.10	0.00	2.50	0.08	2.30	0.02	2.20	0.00	0.80	0.80
sincos	1.90	2.00	0.01	2.20	0.05	1.80	0.01	2.50	0.19	2.80	0.43
ggDiffuseMaterial::getInfo	1.90	1.70	0.02	1.30	0.19	2.40	0.13	2.10	0.02	1.20	0.26
mrMaterial::viewingHit	1.90	1.70	0.02	2.10	0.02	1.90	0.00	2.10	0.02	1.60	0.05
operator(constggHRigidBodyMatrix3&,constggPoint3&)	1.50	1.50	0.00	2.00	0.17	1.00	0.17	1.10	0.11	2.00	0.17
mrMaterial::boundingBox	1.40	1.50	0.01	1.50	0.01	1.50	0.01	0.80	0.26	1.20	0.03
mrXZRectangle::viewingHit	1.20	1.00	0.03	1.10	0.01	1.20	0.00	0.70	0.21	0.40	0.53
proc_at_0x1200ee838	1.20	1.00	0.03	1.20	0.00	1.30	0.01	0.90	0.07	0.80	0.13
mrInstance::selectVisiblePoint	1.10	1.10	0.00	1.70	0.33	0.90	0.04	0.90	0.04	1.20	0.01
operator(float,constggSpectrum&)	1.00	0.90	0.01	1.00	0.00	0.90	0.01	1.40	0.16	0.40	0.36
my_rand(void)	1.00	0.90	0.01	0.90	0.01	1.30	0.09	0.70	0.09	1.60	0.36
mrDiffuseAreaXZRectangleLuminaire::shadowHit	0.90	1.00	0.01	0.70	0.04	0.90	0.00	0.60	0.10	1.60	0.54
ggRayYZRectangleIntersect	0.80	0.90	0.01	1.40	0.45	0.90	0.01	0.70	0.01	0.80	0.00
mrYZRectangle::viewingHit	0.80	0.80	0.00	1.00	0.05	0.90	0.01	0.90	0.01		0.80
ggRayBoxIntersect	0.80	0.80	0.00	0.60	0.05	0.70	0.01	0.80	0.00	1.20	0.20
ggDiffuseVector	0.80	0.90	0.01	0.70	0.01	0.70	0.01	0.70	0.01	0.80	0.00
ggRayXYRectangleIntersect	0.70	0.70	0.00	0.50	0.06	0.60	0.01	0.70	0.00	2.00	2.41
ggSpectrum::operator+=(constggSpectrum&)	0.60	0.70	0.02	0.50	0.02	0.70	0.02	0.40	0.07		0.60
mrXYRectangle::viewingHit	0.60	0.60	0.00	0.60	0.00	0.80	0.07	1.10	0.42	0.40	0.07
mrXZRectangle::boundingBox	0.50	0.50	0.00	0.50	0.00	0.20	0.18	0.60	0.02	0.40	0.02
mrMaterial::selectVisiblePoint	0.50	0.40	0.02		0.50	0.30	0.08	0.10	0.32	0.40	0.02

mrKajiyaPixelRenderer::samplePixel	0.40	0.40	0.00	0.40	0.00	0.30	0.03	0.10	0.23	0.40	0.00
mrDiffuseAreaXZRectangleLuminaire::selectVisiblePoint	0.40	0.40	0.00	0.70	0.23	0.50	0.02	0.10	0.23		0.40
mrInstance::boundingBox	0.40	0.40	0.00	0.30	0.03	0.40	0.00	0.20	0.10	0.80	0.40
mrYZRectangle::shadowHit	0.40	0.30	0.03		0.40	0.30	0.03	0.40	0.00		0.40
mrXYRectangle::shadowHit	0.40	0.40	0.00	0.30	0.03	0.20	0.10	0.50	0.02	0.40	0.00
ggDiffuseBRDF::value	0.40	0.40	0.00	0.40	0.00	0.20	0.10	0.40	0.00	0.40	0.00
mrYZRectangle::boundingBox	0.30	0.40	0.03	0.20	0.03	0.40	0.03	0.60	0.30	0.40	0.03
mrXYRectangle::boundingBox	0.30	0.30	0.00	0.40	0.03	0.20	0.03	0.50	0.13	0.40	0.03
ggJitterSample2::Generate(void)	0.30	0.30	0.00	0.60	0.30	0.30	0.00	0.00	0.30	0.00	0.30
mrBox::shadowHit	0.20	0.30	0.05	0.20	0.00	0.20	0.00	0.40	0.20		0.20
mrBox::viewingHit	0.20	0.20	0.00	0.30	0.05	0.20	0.00	0.20	0.00	0.40	0.20
ggTrain<ggPoint2>::Append(ggPoint2)	0.20	0.10	0.05	0.00	0.20	0.10	0.05	0.10	0.05	0.00	0.20
ggPinholeCamera::getRay	0.20	0.10	0.05	0.10	0.05		0.20	0.10	0.05		0.20
mrInstance::viewingHit	0.10	0.20	0.10		0.10		0.10	0.40	0.90		0.10
ggTrain<ggSpectrum>::Append(ggSpectrum)	0.10	0.10	0.00	0.00	0.10	0.20	0.10	0.20	0.10	0.00	0.10
operator(constggHAffineMatrix3&&.constggPoint3&)	0.10	0.10	0.00	0.10	0.00		0.10	0.40	0.90	0.40	0.90
ggDiffuseBRDF::averageValue(void)	0.10	0.10	0.00	0.10	0.00	0.10	0.00		0.10		0.10
Sum	99.30	99.50	0.76	98.50	4.42	93.70	6.55	97.70	8.66	95.90	18.11
	Ref	Train	Train	Test	Test	LgRed	LgRed	MdRed	MdRed	SmRed	SmRed
			Chi		Chi		Chi		Chi		Chi

90% Confidence level (55 entries) = 67.673

### Function level execution profile at optimization level O3

The following table contains function execution profiles and goodness-of-fit chi-squared statistic values for the train.Kajiya, test.Kajiya, lgred.Kajiya, mdred.Kajiya, and smred.Kajiya datasets as compared to the full SPEC reference datasets. This data was gathered with the hiprof profiling utility. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.Kajiya, Train.Kajiya, Test.Kajiya, Lgred.Kajiya, MdRed.Kajiya, and SmRed.Kajiya columns are the percent of overall execution time spent in the stated function (in the Function column). Numbers in the Train.Kajiya Chi, Test.Kajiya Chi, LgRed.Kajiya Chi, MdRed.Kajiya Chi, and SmRed.Kajiya Chi are the terms of the chi-squared statistic for the stated function (in the function column).

Function	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi
mrSurfaceList::shadowHit	7.70	7.90	0.01	8.00	0.01	8.30	0.05	6.30	0.25	7.30	0.02
ggSpectrum::Set(float)	7.10	6.90	0.01	8.60	0.32	6.50	0.05	7.40	0.01	7.30	0.01
proc_at_0x1200ef0b8	7.00	6.90	0.00	6.50	0.04	6.80	0.01	6.20	0.09	5.30	0.41
mrSurfaceList::viewingHit	6.30	6.30	0.00	5.70	0.06	6.20	0.00	5.70	0.06	3.20	1.53
proc_at_0x1200eea58	5.30	5.10	0.01	5.40	0.00	5.00	0.02	4.00	0.32	4.00	0.32
ggSpectrum::operator=(constggSpectrum&)	4.80	4.90	0.00	4.10	0.10	0.30	4.22	4.30	0.05	4.50	0.02
mrMaterial::shadowHit	4.10	4.10	0.00	4.40	0.02	4.40	0.02	3.70	0.04	2.80	0.41
ggRayXZRectangleIntersect	3.60	3.60	0.00	3.80	0.01	4.00	0.04	3.20	0.04	3.60	0.00
operator(constggHRigidBodyMatrix3&,constggRay3&)	3.00	3.00	0.00	2.70	0.03	2.60	0.05	3.20	0.01	3.60	0.12
operator(constggSpectrum&,constggSpectrum&)	3.00	3.00	0.00	2.50	0.08	3.60	0.12	2.90	0.00	4.00	0.33
sqrt	3.00	3.10	0.00	3.30	0.03	3.30	0.03	3.30	0.03	5.70	2.43
mrGrid::shadowHit	3.00	3.10	0.00	2.20	0.21	3.00	0.00	3.30	0.03	2.80	0.01
mrXZRectangle::shadowHit	2.60	2.60	0.00	2.60	0.00	2.00	0.14	2.90	0.03	3.60	0.38
mrGrid::viewingHit	2.50	2.60	0.00	2.20	0.04	3.00	0.10	3.30	0.26	2.80	0.04
mrkPixelRenderer::directLight	2.40	2.10	0.04	2.60	0.02	2.20	0.02	3.10	0.20	2.40	0.00
mrInstance::shadowHit	2.20	2.00	0.02	1.80	0.07	2.20	0.00	2.70	0.11	2.80	0.16
operator(constggHRigidBodyMatrix3&,constggVector3&)	2.10	2.20	0.00	1.80	0.04	1.80	0.04	2.80	0.23	1.60	0.12
ggDiffuseMaterial::getInfo	1.90	2.00	0.01	1.40	0.13	1.80	0.01	2.40	0.13	1.60	0.05
sincos	1.90	1.90	0.00	1.40	0.13	2.00	0.01	2.00	0.01	2.80	0.43
mrMaterial::viewingHit	1.70	1.80	0.01	1.80	0.01	1.60	0.01	2.30	0.21	2.80	0.71
operator(constggHRigidBodyMatrix3&,constggPoint3&)	1.50	1.50	0.00	1.70	0.03	1.60	0.01	1.30	0.03	1.60	0.01
mrMaterial::boundingBox	1.40	1.50	0.01	1.70	0.06	1.30	0.01	1.50	0.01	1.20	0.03
mrXZRectangle::viewingHit	1.20	1.30	0.01	1.30	0.01	1.30	0.01	1.80	0.30	2.00	0.53
proc_at_0x1200ee838	1.20	1.20	0.00	0.60	0.30	1.10	0.01	1.00	0.03	0.40	0.53
mrInstance::selectVisiblePoint	1.10	1.20	0.01	1.60	0.23	0.90	0.04	0.70	0.15	0.00	1.10
operator(float,constggSpectrum&)	1.00	1.10	0.01	1.20	0.04	0.80	0.04	1.00	0.00	0.40	0.36
my_rand(void)	1.00	1.00	0.00	1.10	0.01	0.80	0.04	1.10	0.01	1.60	0.36
mrDiffuseAreaXZRectangleLuminaire::shadowHit	1.00	1.00	0.00	1.10	0.01	1.00	0.00	0.50	0.25	1.20	0.04
ggRayYZRectangleIntersect	0.80	0.80	0.00	0.90	0.01	0.90	0.01	1.00	0.05	1.20	0.20
ggDiffuseVector	0.80	0.90	0.01	1.40	0.45	0.50	0.11	1.10	0.11	0.80	0.00
ggRayBoxIntersect	0.80	0.80	0.00	0.80	0.00	0.60	0.05	1.00	0.05	1.20	0.20
mrYZRectangle::viewingHit	0.80	0.70	0.01	0.70	0.01	0.70	0.01	0.60	0.05	2.00	1.80
ggRayXYRectangleIntersect	0.70	0.60	0.01	0.80	0.01	0.60	0.01	0.60	0.01	0.80	0.01
ggSpectrum::operator+=(constggSpectrum&)	0.60	0.60	0.00	0.60	0.00	0.60	0.00	1.00	0.27	0.00	0.60
mrXYRectangle::viewingHit	0.60	0.60	0.00	0.50	0.02	0.60	0.00	0.60	0.00	0.00	0.60
mrXZRectangle::boundingBox	0.50	0.50	0.00	0.40	0.02	0.30	0.08	1.20	0.98	0.00	0.50
mrMaterial::selectVisiblePoint	0.50	0.50	0.00	0.40	0.02	0.40	0.02	0.20	0.18	0.00	0.50
mrKajiyaPixelRenderer::samplePixel	0.40	0.50	0.02	0.80	0.40	0.40	0.00	0.40	0.00	0.00	0.40

mrXYRectangle::shadowHit	0.40	0.40	0.00	0.20	0.10	0.50	0.02	0.50	0.02	0.00	0.40
mrDiffuseAreaXZRectangleLuminaire::selectVisiblePoint	0.40	0.40	0.00	0.30	0.03	0.70	0.23	0.60	0.10	0.40	0.00
mrYZRectangle::shadowHit	0.40	0.40	0.00	0.30	0.03	0.40	0.00	0.10	0.23	0.40	0.00
ggDiffuseBRDF::value	0.40	0.40	0.00	0.20	0.10	0.50	0.02	0.00	0.40	0.00	0.40
mrYZRectangle::boundingBox	0.40	0.30	0.03	0.20	0.10	0.20	0.10	0.40	0.00	0.80	0.40
mrXYRectangle::boundingBox	0.30	0.30	0.00	0.20	0.03	0.40	0.03	0.00	0.30	0.40	0.03
ggJitterSample2::Generate(void)	0.30	0.20	0.03	0.50	0.13	0.40	0.03	0.60	0.30	0.80	0.83
mrBox::shadowHit	0.30	0.20	0.03	0.30	0.00	0.30	0.00	0.00	0.30	0.00	0.30
mrBox::viewingHit	0.20	0.20	0.00	0.00	0.20	0.20	0.00	0.40	0.20	0.00	0.20
mrInstance::viewingHit	0.20	0.20	0.00	0.30	0.05	0.10	0.05	0.00	0.20	0.00	0.20
ggTrain<ggPoint2>::Append(ggPoint2)	0.20	0.10	0.05	0.10	0.05	0.20	0.00	0.10	0.05	0.00	0.20
ggPinholeCamera::getRay operator(constggHAffineMatrix3&,const ggPoint3&)	0.20	0.20	0.00	0.00	0.20	0.10	0.05	0.00	0.20	0.40	0.20
ggTrain<ggSpectrum>::Append(ggSpectrum)	0.10	0.10	0.00	0.00	0.10	0.20	0.10	0.00	0.10	0.40	0.90
ggDiffuseBRDF::averageValue(void)	0.10	0.10	0.00	0.30	0.40	0.20	0.10	0.00	0.10	0.00	0.10
Sum	95.10	95.00	0.34	93.40	4.50	89.50	6.11	94.30	7.21	92.50	19.54
	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi

90% Confidence level (53 entries) = 65.423

## Function level execution profile at optimization level O4

The following table contains function execution profiles and goodness-of-fit chi-squared statistic values for the train.Kajiya, test.Kajiya, lgred.Kajiya, mdred.Kajiya, and smred.Kajiya datasets as compared to the full SPEC reference datasets. This data was gathered with the hiprof profiling utility. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.Kajiya, Train.Kajiya, Test.Kajiya, Lgred.Kajiya, MdRed.Kajiya, and SmRed.Kajiya columns are the percent of overall execution time spent in the stated function (in the Function column). Numbers in the Train.Kajiya Chi, Test.Kajiya Chi, LgRed.Kajiya Chi, MdRed.Kajiya Chi, and SmRed.Kajiya Chi are the terms of the chi-squared statistic for the stated function (in the function column).

Function	Ref	Train	Train Chi	Test	Test Chi	LgRed	LgRed Chi	MdRed	MdRed Chi	SmRed	SmRed Chi
ggRayXZRectangleIntersect	9.70	9.50	0.00	10.70	0.10	9.10	0.04	9.40	0.01	10.60	0.08
proc_at_0x1200f14d0	6.70	6.50	0.01	6.40	0.01	7.10	0.02	7.00	0.01	4.90	0.48
mrXZRectangle::shadowHit	6.70	6.70	0.00	6.40	0.01	5.60	0.18	8.10	0.29	5.70	0.15
proc_at_0x1200f1c10	6.60	6.50	0.00	6.30	0.01	7.10	0.04	5.30	0.26	7.20	0.05
mrSurfaceList::viewingHit	6.00	6.00	0.00	4.90	0.20	6.10	0.00	5.80	0.01	6.50	0.04
ggSpectrum::Set(float)	5.30	5.40	0.00	6.80	0.42	4.80	0.05	4.40	0.15	4.90	0.03
ggSpectrum::operator=(constggSpectrum &)	4.80	4.80	0.00	3.90	0.17	3.90	0.17	4.30	0.05	4.20	0.07
operator(constggSpectrum&,constggSpec trum&)	3.00	3.00	0.00	2.90	0.00	3.40	0.05	3.40	0.05	3.00	0.00
sqrt	2.90	2.80	0.00	3.30	0.06	2.90	0.00	2.80	0.00	2.70	0.01
mrMaterial::shadowHit	2.80	2.80	0.00	3.40	0.13	2.60	0.01	3.70	0.29	3.40	0.13
mrSurfaceList::shadowHit	2.70	2.80	0.00	2.80	0.00	2.70	0.00	2.70	0.00	2.70	0.00
mrkPixelRenderer::directLight	2.50	2.70	0.02	1.60	0.32	2.80	0.04	2.60	0.00	2.30	0.02
mrXZRectangle::viewingHit	2.30	2.10	0.02	3.00	0.21	1.90	0.07	1.80	0.11	4.20	1.57
mrGrid::viewingHit	2.30	2.30	0.00	2.30	0.00	2.30	0.00	3.10	0.28	0.80	0.98
mrGrid::shadowHit	2.20	2.20	0.00	2.70	0.11	2.10	0.00	2.00	0.02	2.70	0.11
mrInstance::shadowHit	2.20	2.20	0.00	1.90	0.04	2.10	0.00	2.50	0.04	2.30	0.00
proc_at_0x1200f1280	2.20	2.30	0.00	2.10	0.00	2.30	0.00	3.10	0.37	2.70	0.11
ggDiffuseMaterial::getInfo	2.10	1.90	0.02	1.50	0.17	2.00	0.00	1.80	0.04	0.80	0.80
operator(constggHRigidBodyMatrix3&,& constggRay3&)	1.90	1.90	0.00	2.10	0.02	1.30	0.19	0.80	0.64	2.70	0.34
mrKajiyaPixelRenderer::KajiyaRadiance	1.80	1.90	0.01	2.60	0.36	2.00	0.02	1.50	0.05	1.10	0.27
sincos	1.70	1.60	0.01	1.90	0.02	2.00	0.05	1.70	0.00	1.10	0.21
mrMaterial::viewingHit	1.70	1.80	0.01	1.50	0.02	1.80	0.01	1.40	0.05	1.90	0.02
operator(constggHRigidBodyMatrix3&,& constggVector3&)	1.40	1.50	0.01	1.50	0.01	1.20	0.03	1.50	0.01	0.40	0.71
operator(float,constggSpectrum&)	1.30	1.30	0.00	1.00	0.07	1.70	0.12	1.40	0.01	1.10	0.03
mrMaterial::boundingBox	1.30	1.30	0.00	1.30	0.00	1.40	0.01	1.00	0.07	1.90	0.28
mrInstance::selectVisiblePoint	1.20	1.10	0.01	0.90	0.07	1.60	0.13	1.30	0.01	1.10	0.01
my_rand(void)	1.10	1.00	0.01	0.70	0.15	0.80	0.08	1.00	0.01	0.40	0.45
ggRayYZRectangleIntersect	1.00	0.90	0.01	1.20	0.04	0.60	0.16	1.10	0.01	0.80	0.04
mrDiffuseAreaXZRectangleLuminaire::shadowHit	1.00	1.00	0.00	1.30	0.09	1.10	0.01	0.50	0.25	1.10	0.01
ggRayXYRectangleIntersect	0.80	0.90	0.01	1.20	0.20	0.80	0.00	1.10	0.11	0.40	0.20
mrXYRectangle::viewingHit	0.80	0.70	0.01	0.50	0.11	0.80	0.00	0.60	0.05	1.10	0.11
ggDiffuseVector	0.70	0.80	0.01	0.60	0.01	0.50	0.06	0.80	0.01	1.90	2.06
ggRayBoxIntersect	0.70	0.70	0.00	0.50	0.06	0.50	0.06	0.90	0.06	1.10	0.23
mrInstance::boundingBox	0.60	0.60	0.00	0.40	0.07	0.40	0.07	0.80	0.07	0.00	0.60
ggSpectrum::operator+=(constggSpectrum &)	0.60	0.60	0.00	0.60	0.00	0.60	0.00	0.40	0.07	0.80	0.07
mrXZRectangle::boundingBox	0.50	0.50	0.00	0.50	0.00	0.70	0.08	0.10	0.32	0.00	0.50
mrKajiyaPixelRenderer::samplePixel	0.40	0.30	0.03	0.00	0.40	0.40	0.00	1.00	0.90	0.00	0.40
mrMaterial::selectVisiblePoint	0.40	0.40	0.00	0.30	0.03	0.30	0.03	0.20	0.10	0.00	0.40
mrXYRectangle::shadowHit	0.40	0.40	0.00	0.40	0.00	0.40	0.00	0.30	0.03	0.80	0.40

mrXYRectangle::boundingBox	0.40	0.30	0.03	0.60	0.10	0.50	0.02	0.30	0.03	0.00	0.40
mrDiffuseAreaXZRectangleLuminaire::selectVisiblePoint	0.30	0.30	0.00	0.40	0.03	0.50	0.13	0.40	0.03	0.00	0.30
mrYZRectangle::shadowHit	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.00	0.30
ggDiffuseBRDF::value	0.30	0.30	0.00	0.40	0.03	0.50	0.13	0.10	0.13	0.80	0.83
mrYZRectangle::boundingBox	0.30	0.30	0.00	0.20	0.03	0.20	0.03	0.30	0.00	0.40	0.03
ggPinholeCamera::getRay	0.20	0.20	0.00	0.40	0.20	0.30	0.05	0.00	0.20	0.80	1.80
ggJitterSample2::Generate(void)	0.20	0.30	0.05	0.20	0.00	0.30	0.05	0.10	0.05	0.00	0.20
mrBox::shadowHit	0.20	0.20	0.00	0.10	0.05	0.30	0.05	0.10	0.05	0.00	0.20
ggTrain<ggSpectrum>::Append(ggSpectrum)	0.20	0.20	0.00	0.40	0.20	0.10	0.05	0.10	0.05	0.40	0.20
mrInstance::viewingHit	0.20	0.00	0.20	0.00	0.20	0.20	0.00	0.40	0.20	0.40	0.20
ggTrain<ggPoint2>::Append(ggPoint2)	0.10	0.20	0.10	0.00	0.10	0.20	0.10	0.10	0.00	0.40	0.90
mrBox::viewingHit	0.10	0.10	0.00	0.00	0.10	0.20	0.10	0.10	0.00	0.00	0.10
ggDiffuseBRDF::averageValue(void)	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.00	0.10
operator(constggHAffineMatrix3&,constggPoint3&)	0.10	0.10	0.00	0.00	0.10	0.20	0.10	0.00	0.10	0.00	0.10
Sum	97.30	96.60	0.57	96.90	4.97	95.60	2.61	95.50	5.75	94.50	17.66
	Ref	Train	Train	Test	Test	LgRed	LgRed	MdRed	MdRed	SmRed	SmRed
			Chi		Chi		Chi		Chi		Chi

90% Confidence level (53 entries) = 65.423

### **Instruction Mix profile at optimization level o0**

The following table contains instruction mix breakdown and goodness-of-fit chi-squared statistic values for the train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets, as compared to the full SPEC dataset. This data was gathered with the sim-profile simulator for the SimpleScalar suite. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya columns are the percent of overall instructions of the stated instruction type (in the Inst Type column). Numbers in the Train.kajiya Chi, Test.kajiya Chi, LgRed.kajiya Chi, MdRed.kajiya Chi, and SmRed.kajiya Chi columns are the terms of the chi-squared statistic for the stated instruction type (in the Inst Type column).

252.eon

O0 Program

Inst Type	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi
load	20.13	20.13	0.00	20.15	0.00	20.14	0.00	20.16	0.00	20.23	0.00
store	11.85	11.85	0.00	11.84	0.00	11.85	0.00	11.84	0.00	11.82	0.00
unconditional branch	16.70	16.70	0.00	16.66	0.00	16.69	0.00	16.65	0.00	16.54	0.00
conditional branch	4.31	4.31	0.00	4.32	0.00	4.32	0.00	4.32	0.00	4.34	0.00
int computation	41.40	41.40	0.00	41.38	0.00	41.40	0.00	41.39	0.00	41.34	0.00
fp computation	5.60	5.60	0.00	5.63	0.00	5.61	0.00	5.63	0.00	5.72	0.00
trap	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Sum	99.99	99.99	0.00	99.98	0.00	100.01	0.00	99.99	0.00	100.00	0.00
	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi

90% Confidence level (7 entries) = 10.645

252.eon, kajiya command line

### **Instruction Mix profile at optimization level o1**

The following table contains instruction mix breakdown and goodness-of-fit chi-squared statistic values for the train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets, as compared to the full SPEC dataset. This data was gathered with the sim-profile simulator for the SimpleScalar suite. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya columns are the percent of overall instructions of the stated instruction type (in the Inst Type column). Numbers in the Train.kajiya Chi, Test.kajiya Chi, LgRed.kajiya Chi, MdRed.kajiya Chi, and SmRed.kajiya Chi columns are the terms of the chi-squared statistic for the stated instruction type (in the Inst Type column).

252.eon

O1 Program

Inst Type	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi
load	28.80	28.80	0.00	28.77	0.00	28.79	0.00	28.77	0.00	28.73	0.00
store	16.83	16.82	0.00	16.77	0.00	16.80	0.00	16.76	0.00	16.59	0.00
unconditional branch	3.53	3.53	0.00	3.53	0.00	3.53	0.00	3.53	0.00	3.52	0.00
conditional branch	8.42	8.42	0.00	8.42	0.00	8.42	0.00	8.42	0.00	8.40	0.00
int computation	32.76	32.76	0.00	32.79	0.00	32.78	0.00	32.80	0.00	32.86	0.00
fp computation	9.66	9.66	0.00	9.71	0.00	9.68	0.00	9.73	0.00	9.86	0.00
trap	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.00
Sum	100.00	99.99	0.00	100.00	0.00	100.00	0.00	100.02	0.00	99.98	0.01
	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi

90% Confidence level (7 entries) = 10.645

252.eon, kajiya command line



**Instruction Mix profile at optimization level o2**

The following table contains instruction mix breakdown and goodness-of-fit chi-squared statistic values for the train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets, as compared to the full SPEC dataset. This data was gathered with the sim-profile simulator for the SimpleScalar suite. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya columns are the percent of overall instructions of the stated instruction type (in the Inst Type column). Numbers in the Train.kajiya Chi, Test.kajiya Chi, LgRed.kajiya Chi, MdRed.kajiya Chi, and SmRed.kajiya Chi columns are the terms of the chi-squared statistic for the stated instruction type (in the Inst Type column).

252.eon

O2 Program

Inst Type	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi
load	32.70	32.70	0.00	32.66	0.00	32.68	0.00	32.65	0.00	32.56	0.00
store unconditional branch	20.17	20.16	0.00	20.09	0.00	20.13	0.00	20.06	0.00	19.80	0.01
conditional branch	4.01	4.01	0.00	4.00	0.00	4.00	0.00	4.00	0.00	3.98	0.00
int computation	6.00	6.00	0.00	6.01	0.00	6.00	0.00	6.01	0.00	6.03	0.00
fp computation	25.80	25.80	0.00	25.86	0.00	25.83	0.00	25.89	0.00	26.09	0.00
trap	11.32	11.32	0.00	11.37	0.00	11.34	0.00	11.39	0.00	11.51	0.00
	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.03	0.00
Sum	100.00	99.99	0.00	100.00	0.00	99.98	0.00	100.01	0.00	100.00	0.01
	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi

90% Confidence level (7 entries) = 10.645

252.eon, kajiya command line

### Instruction Mix profile at optimization level o3

The following table contains instruction mix breakdown and goodness-of-fit chi-squared statistic values for the train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets, as compared to the full SPEC dataset. This data was gathered with the sim-profile simulator for the SimpleScalar suite. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya columns are the percent of overall instructions of the stated instruction type (in the Inst Type column). Numbers in the Train.kajiya Chi, Test.kajiya Chi, LgRed.kajiya Chi, MdRed.kajiya Chi, and SmRed.kajiya Chi columns are the terms of the chi-squared statistic for the stated instruction type (in the Inst Type column).

252.eon

O3 Program

Inst Type	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi
load	32.70	32.70	0.00	32.66	0.00	32.68	0.00	32.65	0.00	32.56	0.00
store unconditional branch	20.17	20.16	0.00	20.09	0.00	20.13	0.00	20.06	0.00	19.80	0.01
conditional branch	4.01	4.01	0.00	4.00	0.00	4.00	0.00	4.00	0.00	3.98	0.00
int computation	6.00	6.00	0.00	6.01	0.00	6.00	0.00	6.01	0.00	6.03	0.00
fp computation	25.80	25.80	0.00	25.86	0.00	25.83	0.00	25.89	0.00	26.09	0.00
trap	11.32	11.32	0.00	11.37	0.00	11.34	0.00	11.39	0.00	11.51	0.00
	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.03	0.00
Sum	100.00	99.99	0.00	100.00	0.00	99.98	0.00	100.01	0.00	100.00	0.01
	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi

90% Confidence level (7 entries) = 10.645

252.eon, kajiya command line

### **Instruction Mix profile at optimization level o4**

The following table contains instruction mix breakdown and goodness-of-fit chi-squared statistic values for the train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets, as compared to the full SPEC dataset. This data was gathered with the sim-profile simulator for the SimpleScalar suite. \*90% Conf = Critical value of the chi-squared statistic at the 90 percent confidence level. Numbers in the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya columns are the percent of overall instructions of the stated instruction type (in the Inst Type column). Numbers in the Train.kajiya Chi, Test.kajiya Chi, LgRed.kajiya Chi, MdRed.kajiya Chi, and SmRed.kajiya Chi columns are the terms of the chi-squared statistic for the stated instruction type (in the Inst Type column).

252.eon

O4 Program

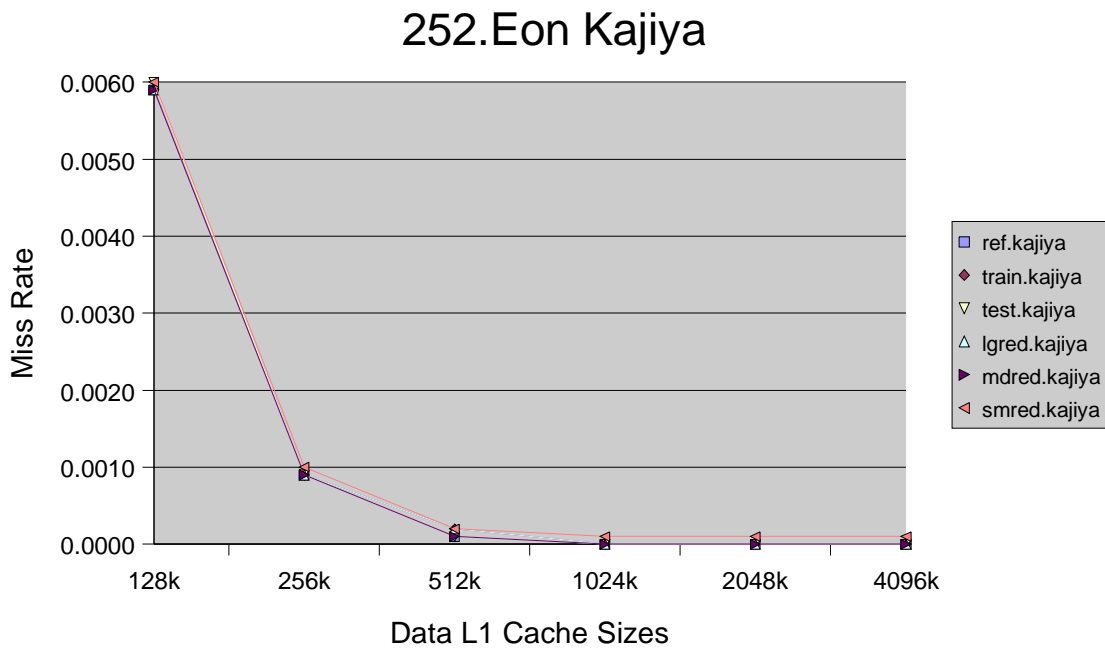
Inst Type	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi
load	32.57	32.57	0.00	32.54	0.00	32.56	0.00	32.53	0.00	32.46	0.00
store unconditional branch	22.31	22.30	0.00	22.22	0.00	22.27	0.00	22.18	0.00	21.88	0.01
conditional branch	3.83	3.83	0.00	3.83	0.00	3.83	0.00	3.82	0.00	3.81	0.00
int computation	5.81	5.81	0.00	5.82	0.00	5.82	0.00	5.82	0.00	5.84	0.00
fp computation	25.02	25.03	0.00	25.09	0.00	25.06	0.00	25.12	0.00	25.31	0.00
trap	10.45	10.45	0.00	10.50	0.00	10.47	0.00	10.52	0.00	10.66	0.00
	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.03	0.00
Sum	99.99	99.99	0.00	100.01	0.00	100.01	0.00	100.00	0.00	99.99	0.02
	Ref Kajiya	Train Kajiya	Train Kajiya Chi	Test Kajiya	Test Kajiya Chi	LgRed Kajiya	LgRed Kajiya Chi	MdRed Kajiya	MdRed Kajiya Chi	SmRed Kajiya	SmRed Kajiya Chi

90% Confidence level (7 entries) = 10.645

252.eon, kajiya command line

## Cache profile

The following chart shows level 1 data cache miss rates for the Ref.kajiya, Train.kajiya, Test.kajiya, LgRed.kajiya, MdRed.kajiya, and SmRed.kajiya datasets. This data was gathered with the sim-cache simulator from the SimpleScalar suite. Miss rate is stated as the ratio of level 1 misses to total level 1 accesses.



252.eon, kajiya command line

### ***Instruction Counts for all Datasets***

The following table shows the instruction counts and estimated simulation time for the ref.kajiya, train.kajiya, test.kajiya, lgred.kajiya, mdred.kajiya, and smred.kajiya datasets. Instruction counts are from the simulated benchmark, compiled at optimization level O0 and run with each input dataset. Estimated simulation times are calculated using a 45,000 instructions per second factor. This factor was determined by observing the simulation rate of a simulator similar to sim-outorder, run on a machine similar to the SPEC 2000 reference machine (a 333 Mhz Sparc).

	<u>Ref</u>	<u>Train</u>	<u>Test</u>	<u>LgRed</u>	<u>MdRed</u>	<u>SmRed</u>
	<u>Kajiya</u>	<u>Kajiya</u>	<u>Kajiya</u>	<u>Kajiya</u>	<u>Kajiya</u>	<u>Kajiya</u>
Instruction Count (in millions)	341244	30701	1537	3630	1243	387
Simulation Time (in hours)	2125.0	189.5	9.5	22.4	7.7	2.4