

# LArSoft - Bug #13063

## Memory errors and leaks

06/28/2016 11:43 AM - Paul Russo

<b>Status:</b>	Assigned	<b>Start date:</b>	06/28/2016
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	Kazuhiro Terao	<b>% Done:</b>	0%
<b>Category:</b>	Reconstruction	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>		<b>Spent time:</b>	0.00 hour
<b>Occurs In:</b>	v06_00_01	<b>Co-Assignees:</b>	
<b>Experiment:</b>	LArSoft		

### Description

The following 8 memory errors were detected by valgrind during a run of uboone reco stage 1, using this command:

```
time nice valgrind -v --leak-check=full --track-origins=yes --show-leak-kinds=all --keep-stacktraces=alloc-and-free --leak-check-heuristics=all --suppressions=/products/root/v6_06_04a/Linux64bit+2.6-2.12-e10-nu-debug/etc/valgrind-root.supp lar -c ~/mrb_uboone/srcs/uboonecode/fcl/reco/reco_uboone_mcc7_driver_stage1.fcl -S mydetsim.list -n 1 2>&1 | tee valgrind_2.log
```

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==25406== Invalid read of size 8
==25406==    at 0x2D3438EA: pmtana::BinnedMaxOccurrence(std::vector<double, std::allocator<double> > const&, unsigned long) (UtilFunc.cxx:82)
==25406==    by 0x2D337764: pmtana::PedAlgoRollingMean::ComputePedestal(std::vector<short, std::allocator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::allocator<double> >&) (PedAlgoRollingMean.cxx:137)
==25406==    by 0x2D334242: pmtana::PMPedestalBase::Evaluate(std::vector<short, std::allocator<short> > const&) (PMPedestalBase.cxx:42)
==25406==    by 0x2D33951D: pmtana::PedAlgoUB::ComputePedestal(std::vector<short, std::allocator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::allocator<double> >&) (PedAlgoUB.cxx:61)
==25406==    by 0x2D334242: pmtana::PMPedestalBase::Evaluate(std::vector<short, std::allocator<short> > const&) (PMPedestalBase.cxx:42)
==25406==    by 0x2D346C56: pmtana::PulseRecoManager::Reconstruct(std::vector<short, std::allocator<short> > const&) const (PulseRecoManager.cxx:56)
==25406==    by 0x2D3449C6: opdet::RunHitFinder(std::vector<raw::OpDetWaveform, std::allocator<raw::OpDetWaveform> > const&, std::vector<recob::OpHit, std::allocator<recob::OpHit> >&, pmtana::PulseRecoManager const&, pmtana::PMPulseRecoBase const&, geo::GeometryCore const&, float const&, detinfo::DetectorClocks const&, std::vector<double, std::allocator<double> > const&, bool const&) (OpHitAlg.cxx:39)
==25406==    by 0x2DD36B6D: opdet::OpHitFinder::produce(art::Event&) (OpHitFinder_module.cc:252)
==25406==    by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingContext const*) (EDProducer.cc:28)
==25406==    by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::CurrentProcessingContext const*) (WorkerT.h:86)
==25406==    by 0x984AC4F: bool art::Worker::doWork<art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0>::MyPrincipal&, art::CurrentProcessingContext const*) (Worker.h:221)
==25406==    by 0x9850FA9: bool art::WorkerInPath::runWorker<art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0>::MyPrincipal&, art::CurrentProcessingContext const*) (WorkerInPath.h:80)
==25406== Address 0x3b6cdda0 is 0 bytes after a block of size 8,000 alloc'd
==25406==    at 0x4A09E85: operator new(unsigned long) (vg_replace_malloc.c:333)
==25406==    by 0x4D9C9D9: __gnu_cxx::new_allocator<unsigned long>::allocate(unsigned long, void const*) (new_allocator.h:104)
==25406==    by 0x4D99F75: std::allocator_traits<std::allocator<unsigned long> >::allocate(std::allocator<unsigned long>&, unsigned long) (alloc_traits.h:357)
==25406==    by 0x4D97739: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_M_allocate(unsigned long) (stl_vector.h:170)
==25406==    by 0x4DD0760: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_M_create_storage(unsigned long) (stl_vector.h:185)
==25406==    by 0x4DCE1A2: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_Vect
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or_base(unsigned long, std::allocator<unsigned long> const&) (stl_vector.h:136)
==25406==   by 0x22F7AE7D: std::vector<unsigned long, std::allocator<unsigned long> >::vector(uns
igned long, unsigned long const&, std::allocator<unsigned long> const&) (stl_vector.h:291)
==25406==   by 0x2D34379F: pmtana::BinnedMaxOccurrence(std::vector<double, std::allocator<double>
> const&, unsigned long) (UtilFunc.cxx:74)
==25406==   by 0x2D337764: pmtana::PedAlgoRollingMean::ComputePedestal(std::vector<short, std::al
locator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::a
llocator<double> >&) (PedAlgoRollingMean.cxx:137)
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==25406==   by 0x2D346C56: pmtana::PulseRecoManager::Reconstruct(std::vector<short, std::allocato
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==25406==   by 0x2D3449C6: opdet::RunHitFinder(std::vector<raw::OpDetWaveform, std::allocator<raw
::OpDetWaveform> > const&, std::vector<recob::OpHit, std::allocator<recob::OpHit> >&, pmtana::Puls
eRecoManager const&, pmtana::PMPulseRecoBase const&, geo::GeometryCore const&, float const&, deti
nfo::DetectorClocks const&, std::vector<double, std::allocator<double> > const&, bool const&) (OpH
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==25406==   by 0x2DD36B6D: opdet::OpHitFinder::produce(art::Event&) (OpHitFinder_module.cc:252)
==25406==   by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingCo
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==25406==   by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::C
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==25406==   by 0x4D99F75: std::allocator_traits<std::allocator<unsigned long> >::allocate(std::al
locator<unsigned long>&, unsigned long) (alloc_traits.h:357)
==25406==   by 0x4D97739: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_M_al
locate(unsigned long) (stl_vector.h:170)
==25406==   by 0x4DD0760: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_M_cr
eate_storage(unsigned long) (stl_vector.h:185)
==25406==   by 0x4DCE1A2: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_Vect
or_base(unsigned long, std::allocator<unsigned long> const&) (stl_vector.h:136)
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llocator<double> >&) (PedAlgoRollingMean.cxx:137)
==25406==   by 0x2D334242: pmtana::PMTPedestalBase::Evaluate(std::vector<short, std::allocator<sh
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ort> > const&) (PMPedestalBase.cxx:42)
==25406==   by 0x2D33951D: pmtana::PedAlgoUB::ComputePedestal(std::vector<short, std::allocator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::allocator<double> >&) (PedAlgoUB.cxx:61)
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==25406==   by 0x2D337788: pmtana::PedAlgoRollingMean::ComputePedestal(std::vector<short, std::allocator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::allocator<double> >&) (PedAlgoRollingMean.cxx:138)
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==25406==   by 0x4D99F75: std::allocator_traits<std::allocator<unsigned long> >::allocate(std::allocator<unsigned long>&, unsigned long) (alloc_traits.h:357)
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==25406==   by 0x4DCE1A2: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_Vector_base(unsigned long, std::allocator<unsigned long> const&) (stl_vector.h:136)
==25406==   by 0x22F7AE7D: std::vector<unsigned long, std::allocator<unsigned long> >::vector(unsigned long, unsigned long const&, std::allocator<unsigned long> const&) (stl_vector.h:291)
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==25406==
==25406== Invalid write of size 8
==25406==   at 0x2D3438F1: pmtana::BinnedMaxOccurrence(std::vector<double, std::allocator<double>

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> const&, unsigned long) (UtilFunc.cxx:82)
==25406== by 0x2D337788: pmtana::PedAlgoRollingMean::ComputePedestal(std::vector<short, std::al
locator<short> > const&, std::vector<double, std::allocator<double> >&, std::vector<double, std::a
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==25406== by 0x2D334242: pmtana::PMPedestalBase::Evaluate(std::vector<short, std::allocator<sh
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==25406== by 0x2D33951D: pmtana::PedAlgoUB::ComputePedestal(std::vector<short, std::allocator<s
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==25406== by 0x2D346C56: pmtana::PulseRecoManager::Reconstruct(std::vector<short, std::allocato
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==25406== by 0x4DD0760: std::_Vector_base<unsigned long, std::allocator<unsigned long> >::_M_cr
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==25406== by 0x2D334242: pmtana::PMPedestalBase::Evaluate(std::vector<short, std::allocator<sh
ort> > const&) (PMPedestalBase.cxx:42)
==25406==
==25406== Conditional jump or move depends on uninitialised value(s)
==25406== at 0x2881E8BC: cmtool::CBAlgoArray::Bool(cluster::ClusterParamsAlg const&, cluster::C
lusterParamsAlg const&) (CBAlgoArray.cxx:75)
==25406== by 0x2914A2CB: cmtool::CMergeManager::RunSeparate(std::vector<cluster::ClusterParamsA
lg, std::allocator<cluster::ClusterParamsAlg> > const&, cmtool::CMergeBookKeeper&) const (CMergeMa
nager.cxx:381)
==25406== by 0x291491CD: cmtool::CMergeManager::IterationProcess() (CMergeManager.cxx:180)
==25406== by 0x29135EE4: cmtool::CMManagerBase::Process() (CMManagerBase.cxx:114)
==25406== by 0x28EC6E9A: cmtool::CMergeHelper::Process(std::vector<std::vector<util::PxHit, std
::allocator<util::PxHit> >, std::allocator<std::vector<util::PxHit, std::allocator<util::PxHit> >
> > const&) (CMergeHelper.cxx:32)

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==25406==   by 0x2B8F0981: cluster::FuzzyClusterMerger::produce(art::Event&) (FuzzyClusterMerger_
module.cc:328)
==25406==   by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingCo
ntext const*) (EDProducer.cc:28)
==25406==   by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::C
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e)0>::MyPrincipal&, art::CurrentProcessingContext const*) (WorkerInPath.h:80)
==25406==   by 0x984BD52: void art::Path::processOneOccurrence<art::OccurrenceTraits<art::EventPr
incipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActio
nType)0>::MyPrincipal&) (Path.h:167)
==25406==   by 0x9850D37: _ZZN3art8Schedule16runTriggerPaths_INS_16OccurrenceTraitsINS_14EventPri
ncipalELNS_16BranchActionTypeE0EEEEEBRNT_11MyPrincipalEENKULS6_E_clIPNS_4PathEEEDaT_ (Schedule.h:1
78)
==25406== Uninitialised value was created by a heap allocation
==25406==   at 0x4A09E85: operator new(unsigned long) (vg_replace_malloc.c:333)
==25406==   by 0x2B8EFAE2: cluster::FuzzyClusterMerger::FuzzyClusterMerger(fhicl::ParameterSet co
nst&) (FuzzyClusterMerger_module.cc:197)
==25406==   by 0x2B8F152D: make_worker (FuzzyClusterMerger_module.cc:457)
==25406==   by 0xA6D8C1B: art::detail::ModuleFactory::makeWorker(art::WorkerParams const&, art::M
oduleDescription const&) (ModuleFactory.cc:53)
==25406==   by 0xA6ABE33: art::PathManager::makeWorker_(art::detail::ModuleConfigInfo const&, std
::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string>, std::allocator<std::pair<
std::string const, std::shared_ptr<art::Worker> > > > &) (PathManager.cc:496)
==25406==   by 0xA6ABA81: art::PathManager::makeWorker_(art::detail::ModuleInPathInfo const&, std
::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string>, std::allocator<std::pair<
std::string const, std::shared_ptr<art::Worker> > > > &, std::vector<art::WorkerInPath, std::alloca
tor<art::WorkerInPath> > &) (PathManager.cc:470)
==25406==   by 0xA6AC2CC: art::PathManager::fillWorkers_(int, std::string const&, std::vector<art
::detail::ModuleInPathInfo, std::allocator<art::detail::ModuleInPathInfo> > const&, cet::exempt_pt
r<art::HLTGlobalStatus>, std::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string
>, std::allocator<std::pair<std::string const, std::shared_ptr<art::Worker> > > > &) (PathManager.c
c:527)
==25406==   by 0xA6ACA18: _ZZN3art11PathManager16triggerPathsInfoENS_10ScheduleIDEENKULRKT_E_clIS
t4pairIKSsSt6vectorINS_6detail16ModuleInPathInfoESaISB_EEEEEEDaS4_ (PathManager.cc:176)
==25406==   by 0xA6ACAC3: _ZSt8for_eachISt17_Rb_tree_iteratorISt4pairIKSsSt6vectorIN3art6detail16
ModuleInPathInfoESaIS6_EEEEEZNS4_11PathManager16triggerPathsInfoENS4_10ScheduleIDEEU1RKT_E_ET0_SD_S
D_SH_ (stl_algo.h:3756)
==25406==   by 0xA6A92BB: _ZN3cet7for_allISt3mapISsSt6vectorIN3art6detail16ModuleInPathInfoESaIS5
_EESt4lessISsESaIS4pairIKSsSt7_EEEZNS3_11PathManager16triggerPathsInfoENS3_10ScheduleIDEEU1RKT_E_E
EDaRSH_T0_ (container_algorithms.h:114)
==25406==   by 0xA6A94A3: art::PathManager::triggerPathsInfo(art::ScheduleID) (PathManager.cc:182
)
==25406==   by 0xA6CC5BA: art::Schedule::Schedule(art::ScheduleID, art::PathManager&, fhicl::Para
meterSet const&, art::TriggerNamesService const&, art::MasterProductRegistry&, art::ActionTable&,
art::ActivityRegistry&) (Schedule.cc:44)
==25406==
==25406== Conditional jump or move depends on uninitialised value(s)
==25406==   at 0x2881E8BC: cmtool::CAlgoArray::Bool(cluster::ClusterParamsAlg const&, cluster::C
lusterParamsAlg const&) (CAlgoArray.cxx:75)
==25406==   by 0x29149D6B: cmtool::CMergeManager::RunMerge(std::vector<cluster::ClusterParamsAlg,
std::allocator<cluster::ClusterParamsAlg> > const&, std::vector<bool, std::allocator<bool> > cons
t&, cmtool::CMergeBookKeeper&) const (CMergeManager.cxx:296)
==25406==   by 0x291491F8: cmtool::CMergeManager::IterationProcess() (CMergeManager.cxx:183)
==25406==   by 0x29135EE4: cmtool::CMManagerBase::Process() (CMManagerBase.cxx:114)
==25406==   by 0x28EC6E9A: cmtool::CMergeHelper::Process(std::vector<std::vector<util::PxHit, std
::allocator<util::PxHit> >, std::allocator<std::vector<util::PxHit, std::allocator<util::PxHit> >
> > const&) (CMergeHelper.cxx:32)
==25406==   by 0x2B8F0981: cluster::FuzzyClusterMerger::produce(art::Event&) (FuzzyClusterMerger_
module.cc:328)
==25406==   by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingCo
ntext const*) (EDProducer.cc:28)
==25406==   by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::C

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urrentProcessingContext const*) (WorkerT.h:86)
==25406==   by 0x984AC4F: bool art::Worker::doWork<art::OccurrenceTraits<art::EventPrincipal, (ar
t::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0>::MyP
rincipal&, art::CurrentProcessingContext const*) (Worker.h:221)
==25406==   by 0x9850FA9: bool art::WorkerInPath::runWorker<art::OccurrenceTraits<art::EventPrinc
ipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionTyp
e)0>::MyPrincipal&, art::CurrentProcessingContext const*) (WorkerInPath.h:80)
==25406==   by 0x984BD52: void art::Path::processOneOccurrence<art::OccurrenceTraits<art::EventPr
incipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchAction
Type)0>::MyPrincipal&) (Path.h:167)
==25406==   by 0x9850D37: _ZZN3art8Schedule16runTriggerPaths_INS_16OccurrenceTraitsINS_14EventPri
ncipalELNS_16BranchActionTypeE0EEEEEBRNT_11MyPrincipalEENKULS6_E_clIPNS_4PathEEEDaT_ (Schedule.h:1
78)
==25406== Uninitialised value was created by a heap allocation
==25406==   at 0x4A09E85: operator new(unsigned long) (vg_replace_malloc.c:333)
==25406==   by 0x2B8EFBEA: cluster::FuzzyClusterMerger::FuzzyClusterMerger(fhicl::ParameterSet co
nst&) (FuzzyClusterMerger_module.cc:212)
==25406==   by 0x2B8F152D: make_worker (FuzzyClusterMerger_module.cc:457)
==25406==   by 0xA6D8C1B: art::detail::ModuleFactory::makeWorker(art::WorkerParams const&, art::M
oduleDescription const&) (ModuleFactory.cc:53)
==25406==   by 0xA6ABE33: art::PathManager::makeWorker_(art::detail::ModuleConfigInfo const&, std
::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string>, std::allocator<std::pair<
std::string const, std::shared_ptr<art::Worker> > >>) (PathManager.cc:496)
==25406==   by 0xA6ABA81: art::PathManager::makeWorker_(art::detail::ModuleInPathInfo const&, std
::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string>, std::allocator<std::pair<
std::string const, std::shared_ptr<art::Worker> > >>, std::vector<art::WorkerInPath, std::alloca
tor<art::WorkerInPath> >>) (PathManager.cc:470)
==25406==   by 0xA6AC2CC: art::PathManager::fillWorkers_(int, std::string const&, std::vector<art
::detail::ModuleInPathInfo, std::allocator<art::detail::ModuleInPathInfo> > const&, cet::exempt_pt
r<art::HLTGlobalStatus>, std::map<std::string, std::shared_ptr<art::Worker>, std::less<std::string
>, std::allocator<std::pair<std::string const, std::shared_ptr<art::Worker> > >>&) (PathManager.c
c:527)
==25406==   by 0xA6ACA18: _ZZN3art11PathManager16triggerPathsInfoENS_10ScheduleIDEENKULRKT_E_clIS
t4pairIKSsSt6vectorINS_6detail16ModuleInPathInfoESaISB_EEEEEEDaS4_ (PathManager.cc:176)
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ModuleInPathInfoESaIS6_EEEEEZNS4_11PathManager16triggerPathsInfoENS4_10ScheduleIDEEU1RKT_E_ET0_SD_S
D_SH_ (stl_algo.h:3756)
==25406==   by 0xA6A92BB: _ZN3cet7for_allIst3mapISsSt6vectorIN3art6detail16ModuleInPathInfoESaIS5
_EESt4lessISsESaIst4pairIKSsSt7_EEEEZNS3_11PathManager16triggerPathsInfoENS3_10ScheduleIDEEU1RKT_E_E
EDaRSH_T0_ (container_algorithms.h:114)
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meterSet const&, art::TriggerNamesService const&, art::MasterProductRegistry&, art::ActionTable&,
art::ActivityRegistry&) (Schedule.cc:44)
==25406==
==25406== Conditional jump or move depends on uninitialised value(s)
==25406==   at 0x27BEE1CE: trkf::SeedFinderAlgorithm::ConsolidateSeed(recob::Seed&, art::PtrVecto
r<recob::Hit> const&, std::vector<char, std::allocator<char> >&, std::vector<std::vector<std::vect
or<int, std::allocator<int> >, std::allocator<std::vector<int, std::allocator<int> > > >, std::all
ocator<std::vector<std::vector<int, std::allocator<int> >, std::allocator<std::vector<int, std::al
locator<int> > > >>&, bool) (SeedFinderAlgorithm.cxx:565)
==25406==   by 0x27BEC5D9: trkf::SeedFinderAlgorithm::FindSeeds(art::PtrVector<recob::Hit> const&
, std::vector<art::PtrVector<recob::Hit>, std::allocator<art::PtrVector<recob::Hit> > >&, unsigned
int) (SeedFinderAlgorithm.cxx:259)
==25406==   by 0x27BF2D7C: trkf::SeedFinderAlgorithm::GetSeedsFromUnSortedHits(art::PtrVector<rec
ob::Hit> const&, std::vector<art::PtrVector<recob::Hit>, std::allocator<art::PtrVector<recob::Hit>
> >&, unsigned int) (SeedFinderAlgorithm.cxx:1130)
==25406==   by 0x27D1E431: trkf::Track3DKalmanHitAlg::makeTracks(std::vector<trkf::KalmanInput, s
td::allocator<trkf::KalmanInput> >&) (Track3DKalmanHitAlg.cxx:139)
==25406==   by 0x32F30069: trkf::Track3DKalmanHit::produce(art::Event&) (Track3DKalmanHit_module.
cc:216)
==25406==   by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingCo
ntext const*) (EDProducer.cc:28)
==25406==   by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::C
urrentProcessingContext const*) (WorkerT.h:86)
==25406==   by 0x984AC4F: bool art::Worker::doWork<art::OccurrenceTraits<art::EventPrincipal, (ar

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rt::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0>::MyP
rincipal&, art::CurrentProcessingContext const*) (Worker.h:221)
==25406==   by 0x9850FA9: bool art::WorkerInPath::runWorker<art::OccurrenceTraits<art::EventPrinc
ipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionTyp
e)0>::MyPrincipal&, art::CurrentProcessingContext const*) (WorkerInPath.h:80)
==25406==   by 0x984BD52: void art::Path::processOneOccurrence<art::OccurrenceTraits<art::EventPr
incipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchAction
Type)0>::MyPrincipal&) (Path.h:167)
==25406==   by 0x9850D37: _ZZN3art8Schedule16runTriggerPaths_INS_16OccurrenceTraitsINS_14EventPri
ncipalELNS_16BranchActionTypeE0EEEEEEbRNT_11MyPrincipalEENKULS6_E_clIPNS_4PathEEEDaT_ (Schedule.h:1
78)
==25406==   by 0x9850DE6: _ZN3art8Schedule21doForAllEnabledPaths_IZNS0_16runTriggerPaths_INS_16Oc
currenceTraitsINS_14EventPrincipalELNS_16BranchActionTypeE0EEEEEEbRNT_11MyPrincipalEEU1S7_E_EEvS7_
(Schedule.h:205)
==25406==   Uninitialised value was created by a stack allocation
==25406==   at 0x27BED84B: trkf::SeedFinderAlgorithm::ConsolidateSeed(recob::Seed&, art::PtrVecto
r<recob::Hit> const&, std::vector<char, std::allocator<char> >&, std::vector<std::vector<std::vect
or<int, std::allocator<int> >, std::allocator<std::vector<int, std::allocator<int> > > >, std::all
ocator<std::vector<std::vector<int, std::allocator<int> >, std::allocator<std::vector<int, std::al
locator<int> > > > >&, bool) (SeedFinderAlgorithm.cxx:453)
==25406==
==25406== Conditional jump or move depends on uninitialised value(s)
==25406==   at 0x27BEE1CE: trkf::SeedFinderAlgorithm::ConsolidateSeed(recob::Seed&, art::PtrVecto
r<recob::Hit> const&, std::vector<char, std::allocator<char> >&, std::vector<std::vector<std::vect
or<int, std::allocator<int> >, std::allocator<std::vector<int, std::allocator<int> > > >, std::all
ocator<std::vector<std::vector<int, std::allocator<int> >, std::allocator<std::vector<int, std::al
locator<int> > > > >&, bool) (SeedFinderAlgorithm.cxx:565)
==25406==   by 0x27BEC197: trkf::SeedFinderAlgorithm::FindSeeds(art::PtrVector<recob::Hit> const&
, std::vector<art::PtrVector<recob::Hit>, std::allocator<art::PtrVector<recob::Hit> > >&, unsigned
int) (SeedFinderAlgorithm.cxx:205)
==25406==   by 0x27BF2D7C: trkf::SeedFinderAlgorithm::GetSeedsFromUnSortedHits(art::PtrVector<rec
ob::Hit> const&, std::vector<art::PtrVector<recob::Hit>, std::allocator<art::PtrVector<recob::Hit>
> >&, unsigned int) (SeedFinderAlgorithm.cxx:1130)
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td::allocator<trkf::KalmanInput> >&) (Track3DKalmanHitAlg.cxx:139)
==25406==   by 0x32F30069: trkf::Track3DKalmanHit::produce(art::Event&) (Track3DKalmanHit_module.
cc:216)
==25406==   by 0xA6308D0: art::EDProducer::doEvent(art::EventPrincipal&, art::CurrentProcessingCo
ntext const*) (EDProducer.cc:28)
==25406==   by 0xA6D107D: art::WorkerT<art::EDProducer>::implDoBegin(art::EventPrincipal&, art::C
urrentProcessingContext const*) (WorkerT.h:86)
==25406==   by 0x984AC4F: bool art::Worker::doWork<art::OccurrenceTraits<art::EventPrincipal, (ar
t::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionType)0>::MyP
rincipal&, art::CurrentProcessingContext const*) (Worker.h:221)
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ipal, (art::BranchActionType)0> >(art::OccurrenceTraits<art::EventPrincipal, (art::BranchActionTyp
e)0>::MyPrincipal&, art::CurrentProcessingContext const*) (WorkerInPath.h:80)
==25406==   by 0x984BD52: void art::Path::processOneOccurrence<art::OccurrenceTraits<art::EventPr
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Type)0>::MyPrincipal&) (Path.h:167)
==25406==   by 0x9850D37: _ZZN3art8Schedule16runTriggerPaths_INS_16OccurrenceTraitsINS_14EventPri
ncipalELNS_16BranchActionTypeE0EEEEEEbRNT_11MyPrincipalEENKULS6_E_clIPNS_4PathEEEDaT_ (Schedule.h:1
78)
==25406==   by 0x9850DE6: _ZN3art8Schedule21doForAllEnabledPaths_IZNS0_16runTriggerPaths_INS_16Oc
currenceTraitsINS_14EventPrincipalELNS_16BranchActionTypeE0EEEEEEbRNT_11MyPrincipalEEU1S7_E_EEvS7_
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r<recob::Hit> const&, std::vector<char, std::allocator<char> >&, std::vector<std::vector<std::vect
or<int, std::allocator<int> >, std::allocator<std::vector<int, std::allocator<int> > > >, std::all
ocator<std::vector<std::vector<int, std::allocator<int> >, std::allocator<std::vector<int, std::al
locator<int> > > > >&, bool) (SeedFinderAlgorithm.cxx:453)
==25406==

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**Related issues:**

Related to art - Support #13450: Memory usage in merging art files

**Closed**      **08/04/2016**

Related to LArSoft - Bug #14182: Memory errors and leaks

**Assigned**    **10/19/2016**

## History

### #1 - 06/28/2016 12:10 PM - Paul Russo

As an additional note evidence for per-event memory hoarding in this job was found. Although the memory leak checker shows that this memory growth is released at the end of the job, so this is not a memory leak, there is a definite growth in memory use per-event (hoarding) for a subset of the LArSoft code modules in use in the uboone stage 1 reco:

MemoryTracker Per-module SUMMARY

( Numbers in '['...' ]' correspond to the event nos. in the general summary. )

Modules increasing Vsize (Mbytes)	Vsize	\u0394 Vsize	RSS	\u0394 RSS
=====				
reco:mchitfinder:MCHitFinder				
[1] run: 1 subRun: 1 event: 1	2034.926	595.047	1093.086	583.879
[2] run: 1 subRun: 1 event: 2	2606.211	16.000	1680.902	26.676
-----				
reco:digitfilter:RawDigitFilterUBooNE				
[1] run: 1 subRun: 1 event: 1	2173.320	138.395	1231.012	137.289
-----				
reco:caldata:CalWireROI				
[1] run: 1 subRun: 1 event: 1	2193.246	19.926	1249.137	18.125
-----				
reco:gaushit:GausHitFinder				
[1] run: 1 subRun: 1 event: 1	2203.738	10.492	1264.324	15.188
[2] run: 1 subRun: 1 event: 2	2614.211	8.000	1682.176	0.262
[4] run: 1 subRun: 1 event: 4	2762.352	0.008	1832.809	1.062
-----				
reco:fuzzyclustermerger:FuzzyClusterMerger				
[1] run: 1 subRun: 1 event: 1	2209.941	6.203	1271.637	6.664
-----				
reco:trackkalmanhit:Track3DKalmanHit				
[1] run: 1 subRun: 1 event: 1	2230.508	20.566	1293.391	21.754
-----				
reco:stitchkalmanhit:TrackStitcher				
[1] run: 1 subRun: 1 event: 1	2233.508	3.000	1296.840	3.449
-----				
reco:trackkalmanhitcalo:Calorimetry				
[1] run: 1 subRun: 1 event: 1	2241.602	8.094	1303.461	6.621
-----				
reco:stitchkalmanhitcalo:Calorimetry				
[1] run: 1 subRun: 1 event: 1	2246.605	5.004	1303.934	0.473
-----				
reco:stitchkalmanhitContTag:TrackContainmentTagger				
[1] run: 1 subRun: 1 event: 1	2251.629	5.023	1308.551	4.082

For these modules, the memory usage grows and grows and exceeds memory limits no matter what the limit is (eventually).

There are two patterns: some grow at input-file switch and some grow per-event.

Need to determine what the memory is being used for. It may be legitimate, but the memory should be released when the module has finished processing the file or the event. If you wait for the end of job cleanup, you may have exceeded the memory limit. This causes the job to run and crash.

### #2 - 07/25/2016 10:46 AM - Gianluca Petrillo

- Category set to Reconstruction

- Status changed from New to Feedback

- Occurs In v06\_00\_01 added

Bout this last report by Paul, that seems to be extracted from a MicroBooNE reconstruction "stage 1": can MicroBooNE confirm and produce a relevant test case to be studied?

Given the type of problem, a grid-like job with many events (e.g. 100) would be the best starting point.

### #3 - 08/05/2016 09:38 AM - Gianluca Petrillo

- Related to Support #13450: Memory usage in merging art files added

### #4 - 09/06/2016 10:49 AM - Katherine Lato

- Status changed from Feedback to Accepted

- Assignee set to Katherine Lato

Need to break into subtasks and get code authors involved in fixing, some may be memory hoarding not a leak. Katherine will work with Erica on



finding the code authors and what instructions to give. Paul met with Gianluca, then stopped by Katherine's desk--have updated the description above so it should be clear what code module owners are to do.

#### #5 - 09/06/2016 02:29 PM - Gianluca Petrillo

Paul reminded me that this issue is not primarily about memory hoarding, but about the effective bugs (leaks) reported by valgrind.

The hints of memory hoarding may still be real, and they might deserve some exploration.

My comment was about MicroBooNE testing that there is actually steady memory increase, and if that is confirmed, we would need a way to clearly observe that, so that when we solve it we have as clear a way to see it is indeed fixed.

That should be a different issue than this one.

#### #6 - 09/13/2016 09:17 AM - Katherine Lato

As mentioned at the 9/13/16 Coordination meeting, we will be dividing the ticket into a number of sub-tickets. These will be assigned to code authors with tools and guidance to fix the problem.

#### #7 - 10/19/2016 09:42 AM - Katherine Lato

- Related to Bug #14182: Memory errors and leaks added

#### #8 - 10/19/2016 09:49 AM - Katherine Lato

- Assignee changed from Katherine Lato to Kazuhiro Terao

- Priority changed from Low to Normal

Tracy Usher has an issue ([#14182](#)) for:

SeedFinderAlgorithm.cxx:565

SeedFinderAlgorithm.cxx:453

This is to fix

UtilFunc.cxx:82

CBAlgoArray.cxx:75

Please contact Erica or myself if you have any questions.

Here's the email chain for reference:

Hi Kazu,

It would be great if you could fix those bugs, because I doubt that that code is used in DUNE, so it'd be difficult for me to test it after fixing the bugs.

Thank you!

Gleb

From: Kazuhiro Terao <[kazuhiro@nevis.columbia.edu](mailto:kazuhiro@nevis.columbia.edu)>

Sent: Tuesday, October 18, 2016 12:56:41 PM

To: Gleb Sinev

Cc: Erica Snider; Katherine Lato; Alexander I. Himmel

Subject: Re: LArSoft code owner needed

Hi,

I didn't look in details but a quick glance at it seems like what Erica suggested is correct.

But I am not the code author so cannot say for sure.

But I would not care about code author apriori and just run gdb w/ break point to check the hypothesis is correct.

Or run a unit test in python script.

For a reference, the original code repository is here: <https://github.com/drinkingkazu/OpticalRecoTool/tree/master/OpHitFinder>

If you want me to change/fix the code, I am happy to do that or happy to have anyone else does that.

I am seeing another definite bug (though a new one and may only concern UB), so will touch this code anyway.

Kazu

On Oct 14, 2016, at 12:43 PM, Gleb Sinev <[gleb.sinev@duke.edu](mailto:gleb.sinev@duke.edu)> wrote:

Hi Erica,

Thanks for the explanation!

I think I understand it now.

Also, can't `ctr\_v` be resized every time the function is called (between lines 74 and 75, for example) in order to fix the potential bug you mentioned?

Gleb

From: Erica Snider <[erica@fnal.gov](mailto:erica@fnal.gov)>

Sent: Friday, October 14, 2016 2:30:52 AM

To: Katherine Lato; Gleb Sinev; Alexander I. Himmel; Kazuhiro Terao

Subject: Re: LArSoft code owner needed

Hi Gleb,

I have taken a brief look at this code. (Gianluca was there for part of this too.) There is definitely a bug in BinnedMaxOccurrence (UtilFunc.cxx) that will cause this error, and a second potential problem that depends on the upstream code.

The definite bug is the following: the value of "index" which is used to access elements of "ctr\_v" will always equal the value of "nbins" at least once during execution of the loop over v (lines 76 through 84). That happens when the value of `mean_v[l]` = the maximum value in the vector, which is also the value of `*res.second`. When "index" is equal to nbins,, then the operation at line 82 causes an out of bounds read and write of `ctr_v`.

Presumably, the fix is to check for this special value and then set index to nbins – 1. In any event, this is a bug. Kazu owns the code here, so should confirm that what I've said is correct.

The second problem is just a potential bug. Line 74 sets a static local vector variable "ctr\_v" to length "nbins", which is a call argument. If the function is ever called with a value of nbins greater than the value in the first call, then the length of `ctr_v` will be short, and there will be out of bounds reads and writes that would cause the observed error. I've not looked at the calling code yet to see whether this can happen.

Erica

**#9 - 10/19/2016 11:37 AM - Katherine Lato**

*- Status changed from Accepted to Assigned*