MICROSCOPE IMAGE ACQUISITION Specifications Settings nildren Entities (choose on | WavelenghtProfileFile | WavelenghtProfileFile GenericExcitationSource Inverted Type Tuneable Pulse RepetitionRate WavelenghtProfileFile EnvironmentControl LaserMedium LEDModule MicroscopeTable (Wavelength (PockelCell) | ProjectionAngle LaserClass Position CutOn WavelenghtProfileFile VibrationControl WavelengthRange MultiLaserEngine TemperatureControlled SingleMode NumberOfLasers MultiportSwitchTime Children Entities Children Entities SampleOptics Positioning-APE MechanicalStage LightSourceCoupling-AF LightGuide MirroringDeviceRef PiezoelectricStage ID (MirroringDeviceID) IS-A RefractiveIndex XYPositionLinearityError NumericalAperture CouplingLensRef Temperature Motorized AnnotationRef _____ Geometry H------ID (OpticalApertureID) ZTravelRange _____ MaterialName Children Entitie (extension base) SingleMode FocusingDevice-APE OpticsHolderRef O2Percent WaveguideMode Objective MapAnnotation ZRepetability Map [Sub-Element] Diameter ID (OpticsHolderID) Description [Sub-Element] Information (extended by) ObjectiveTurret extends) FreeBeam RecommendedImmersion PolarizationOpticsRef ZDrive Experiment Namespace Focusing Annotator (ExperimenterID) MicroscopeSettings Reference NominalMagnification DirectMount ID (PolarizationOpticsID) AnnotationRef Correction MountType (extension base) Purpose (was Type) D (MicroscopelD) -----Description IndividualObjectiv FocusStabilizationDevic PrismRef ExperimenterRef CalibratedMagnification AnnotationRef TotalEffectiveMagnification **`** Focusing WorkingDistance A description for the annotatio Children Entities Description [Sub-Element] MicroscopeTubeRef VendorBinData [plain-text multi-line string] MagnificationChangerRef AcquisitionSoftware (choose on ObjectiveRef ExcitationFilterRef WavelenghtOfReflectedBeam ImagingMethod _____ AnnotationRef magingMethodTermAcession AnnotationRef MicroscopeTable ContrastModulator BeamExpander ID (AnnotationID) /isualization Method CorrectionCollar sualizationMethodTermAccessior Version ExperimentRef CorrectionCollarType Value D (MicroscopeTableID) ExperimenterRef PhaseContrastType (was DichroicRef) TagTermAccession ExperimentGroupRef Collimator extends) luorophoreType D (MirroringDeviceID) ReleaseDate AnnotationRef Attenuation FrontFocalLength TiffData AcquisitionDate [Sub-Element **○** Wavelenght BackFocalLenght Publication Description [Sub-Element] Condenser ParfocalizingDistance ObjectiveViewField | Sample OutputPower ID (FilterID) FirstT FirstC AnnotationRef ExcitationFilterRef PlaneCount MicroscopeTube BiologicalOrigin LiveSample AnnotationRef MetaDataOnly ID (CouplingID) Organism OrganismTermAccession Pixels SampleType OrganismPart ID (MirroringDeviceID) OrganismPartTermAccession BinData DimensionOrder ID (FilterID) (extension base) SamplePreparationMethod ______ EmissionFilterRef PixelType (was Type) DarkFieldStop SamplePreparationMethodTermAccession Compression SignificantBits Children Entities (choose one Manufacturer ID (FilterID) Interleaved MountingMediumRefractiveIndex SerialNumber FacingTheObjective ID (MirrorID) AnnotationRef HoffmanSlitPlate FilterCubeRef FilterCube LotNumber NGFFData SpecsFile ExcitationFilterRef _____ Optics Holder Position | | ID (FilterID) IrisDiaphragm FilterCubeRef PhysicalSizeX ID (FilterID) FilterSlider PhysicalSizeY FilterSet **ObjectiveSettings** ManufactuerSpecs) ID (FilterCubeID) PhysicalSizeZ AdditionalVendor Timeincrement つ (ObjectiveID) ID (MirrorID) PhaseRing ExcitationFilterRef CorrectionCollarPosition FilterCubeTurret AnnotationRef (was Correcion Collar) | Namespace ImmersionMedium (was Medium PhaseNumber Annotator (ExperimenterID) CenterStopDiameter ImmersionRefractiveIndex GenericFilterRef AnnotationRef CoverGlass (extends (was RefractiveIndex) SlitWidth FilterWheel StandardDichroicRef ID (FilterID) MirroringDeviceRef FilterCube Description ManufactuerSpecs) AnnotationRef MeasuredRefractiveIndex VarelRing Additional ID (MirroringDeviceID) D (MirroringDeviceID) ۸| St| ExposureTime Temperature A description for the annotation. DimensionMap | St| StagePositionX (was PositionX) AdditionalLensSetting [plain-text multi-line string] OpticsTurret _ Ar StagePositionY (was PositionY EmissionFilterRef CoverGlassNr. LensRef H StagePositionZ (was PositionZ CoverGlassThickness ID (LensID) -- AnnotationRef Compression AnnotationRef Function Children Entities ______ BigEndian ID HashSHA1 [Sub-Element] PlaneTransformation Lens-APE Filter-APE ID (AnnotationID) PrimsRef PolarizationOpticsRef (choose one Children Entities (choose or AdditionalMirror TypeDescription Matrix] PI PixelDwellTime Value ID (PolarizationOpticsID) Γ∤ FocalPositionZ TransmittanceRange PresetStepIncrement MagnificationChange ExcitationFilter Sa PlaneOffsetX FilterHolderPosition (was FilterWheel TheAdditionalDimensionRef ID (MirrorID) Magnification OpticalApertureRef AnnotationRef NumericalAperture SamplePositioningRef ActualMountedAngle Row Description [Sub-Element] |Wavelenght GenericLens D (OpticalApertureID) EmissionFilter Construction FWHMBandwidth **OpticalApertureRef** Geometry Transmittance AttenuationCoefficient RefractiveIndex TransmittanceRange AttenuationMethod ttenuationCoefficient ID (OpticalApertureD) ReflectanceRange BeamExpanderLens Channel NeutralDensityFilter WorkingDistance ImageDistance ObjectDistance (deprecated: CutIn, CutOut, TheAdditional Cell CutInTolerance, CutOutTolerance) OpticalDeviceRef Channel Thickness Dimension Transmittance AngleOfIncidence ontFocalLength CollimatorLens |Wavelenght Channel ID (OpticalDeviceID) Polarization CellValue ➤ BackFocalLenght FWHMBandwidth | Wavelenght GenericFilter TransmittanceProfile **TheAdditionalDimensionIndex** Reflectance FWHMBandwidth | PolarizationOpticsRef TheIncrementStamp C| III| Name CondenserLens RadiusOfCurvature TransmittanceRange Children Entities (choose one) LightPath Ex A Samples Per Pixe ID (PolarizationOpticsID) MaterialName | E| C| IlluminationType MirroringDevice-APE Children Entities (choose one) F|| Ex Acquisition Mode GlassCode PrismSettings FWHMBandwidth CouplingLens (was Dichroic) | C| Er| ContrastMethod CameraSettings Transmittance | A| FI| ExcitationWavelength nnotationRef ✓ ID (PrismID) | C | EmissionWavelength AnnotationRef ______ ReflectingMirror PositionSetting ReflectanceRange A Fluorophore (was Fluor) TransmittanceProfileFie RelayLens Prism __ Color Integration ReflectanceProfileFile > Wavelenght AnnotationRef Reflectance ReflectanceProfileFile FWHMBandwidth FrameRate Reflectance AngleOfIncidence OperatingTemperature TubeLens Children Entities MirrorType Beamsplitter Geometry ID (DetetectorID) PointDetectorSettings RadiusOfCurvature (choose one Transmittance SubstrateType OilObjective AnalogGain (was Gain) TransmissionAngle PhotonCounting Compound SubstrateMaterial TransmittanceProfileFile StandardDichroic HighVoltage Design PrismAngle Reflectance OffsetMode WavelengthRange ReflectanceProfileFile AmplificationGain RefractiveIndex _____ Reflectance PeakWavelength Dichroic-APE AdditionalDichroic **OpticalComponent** Detector-APE AngleOfIncidence CutOn DeviationAngle CutOff (was Detector) Position AbbeNumber WavelenghtProfileFile Technology MaterialName ID (OpticalComponentID) AttenuationMethod GlassCode AttenuationCoefficient Children Entities Density (additional attributes removed CoatingMethod (choose on AnnotationRef or moved to new Detector Settings Thickness or Laser Scanner classes) Polarization PolarizationOptics FilterHolderPosition AnalogVideo TransmittanceProfileFile ■ MaxBitDepth ReflectanceProfileFile DynamicRange QuantumEfficiency Function CrossPolarizer _____ CCD WavelengthRange ElectronConversionFactor ______ Children Entities (choose on ReadOutNoise BeamSplitter PeakWavelength DetectorNoiseModel Camera-APE ManufacturerOffset Illumination RegisterWellCapacity CutOff WavelenghtProfileFile Mount AmbientOperatingTemperature Construction CMOS Fabrication Retardation ■ AmbientOperatingHumidity MaterialName GlassCode ArrayWidth ArrayHeight PixelWidth PixelHeight Color PixelWellCapacity VerticalClockSpeed MaximumFrameRate Intensified AnnotationRef Type IntensifierType WavelengthRange RegisterWellCapacity PeakWavelength CutOn CutOff Children entities (choose one WavelenghtProfileFile _____ PointDetector-APE PhotomultiplierTube This is a graphical representation of a possible extension of the OME data model developed by members of the Imaging Working Group of the 4D Nucleome consortium. The graph utilizes the Entity-Relationship formalism. In this formalism information about a real world situation/thing Units are omitted for simplicity sake. _____ APE, Abstract Parent Entity MultianodeChannelNr (in our case a Microscope and an image acquired using that instrument) are represented by three types of model elements: ResponseTime MultianodeArrangement DeadTime AnnotationRef: This element always refers to a Comment/ 1) Entities = Boxes; 2) Relationships = lines connecting boxes; 3) Attributes = fields within boxes Annotation element as described for Channel. However for When describing a real life situation/thing: CollectionEfficiency 1)ENTITIES corresponds to NOUNS = the things we want to collect information about. simplicity sake most Comment/Annotation elements have GenericDetector PhotoDiode been omitted and the AnnotationRef has been inserted in 2) RELATIONSHIPS corresponds to VERBS = actions/state/occurrence that connect Entities with each other the referring element as an attribute. 3) ATTRIBUTES corresponds to ADJECTIVES = the actual information about each Entity we want to collect MapAnnotation [Sub-Element] PINJunction Avalanche In order to read the schema please start from INSTRUMENT and from and IMAGE for the Specifications and Settings section respectively. Then follow the lines to the connected boxes and think something like: 1) An Instrument has a Microscope_Body, might rest on a Microscope_Table, and has a Light_Source etc.; 2) An Image was For questions or comments please contact: HybridPhotoDetector caterina.strambio@umassmed.edu produced as part of a specific Experiment, was collected in a specific Imaging_Environment, was collected using specific Microscope_Settings etc.
