Autism spectrum disorder (ASD) has an estimated incidence of 1:68 in the United States and is among the most common and pervasive neurodevelopmental disorders. Difficulties in face processing, one central component of social behaviors, have been identified as a characteristic behavioral phenotype of ASD. Unfortunately, the cognitive and brain sources of this difficulty remain largely unclear, especially in children. Therefore, my proposed research focuses on understanding the abnormalities in the brains of children with ASD and their relationship with social deficits. Specifically, I will examine the properties of white-matter connectivity within the brain network for face processing in ASD children compared to typical developing children. Importantly, recent evidence from individuals who have face recognition deficit (i.e., developmental prosopagnosia) showed that their aberrant white-matter connectivity is associated with the difficulties in face recognition, suggesting a clear role of white matter connectivity in face processing. However, no previous studies have examined this association in ASD. Thus, I will examine the white-matter abnormality in ASD and the association with behavioral challenges in face processing as well as with social function in general, to better understand the contribution of white-matter connectivity on social deficits in ASD.